

# KIC 003233043

## Q1-17 DR25 TCE Parameters

TCE	Run Type	KOI?	Period (Days)	Epoch (BKJD)	Depth (ppm)	Duration (Hours)	MES	SNR	$R_{\star}$ ( $R_{\odot}$ )	$T_{\star}$ (K)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
003233043-01	OBS	0966.01	0.758929	131.541689	1155.0	0.763	37.2	99.0	1.78	5075	7.64	7617.36
003233043-02	OBS	No	0.758930	131.920507	1256.1	0.707	95.7	121.0	1.78	5075	8.09	7617.35

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
003233043-01	OBS	FP	0.00	0	1	0	0	MOD_SEC_DV—MOD_SEC_ALT—HAS_SEC_TCE
003233043-02	OBS	FP	0.00	1	1	0	0	IS_SEC_TCE

**Notes:** OBS = Observed. INJ = Injected. INV = Inverted. SCR = Scrambled.

N = Not Transit-Like. S = Stellar Eclipse. C = Centroid Offset. E = Ephemeris Match.

See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

## Ephemeris Match Information For 003233043-01

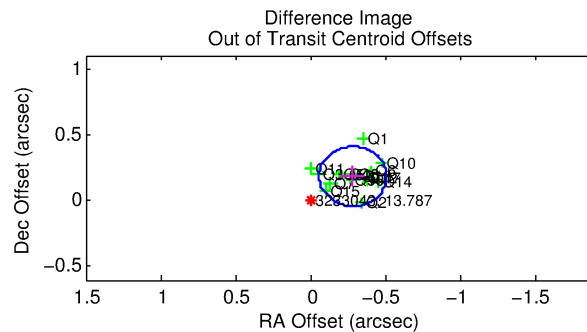
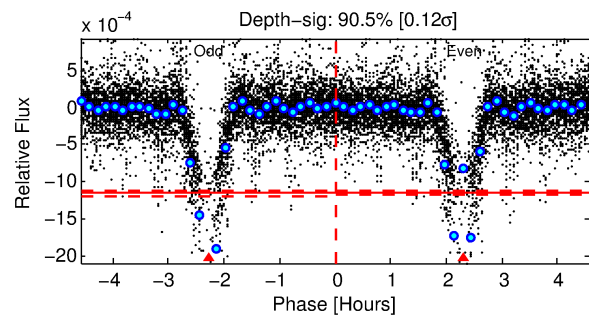
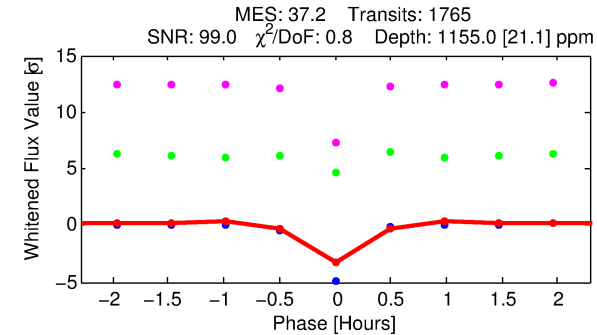
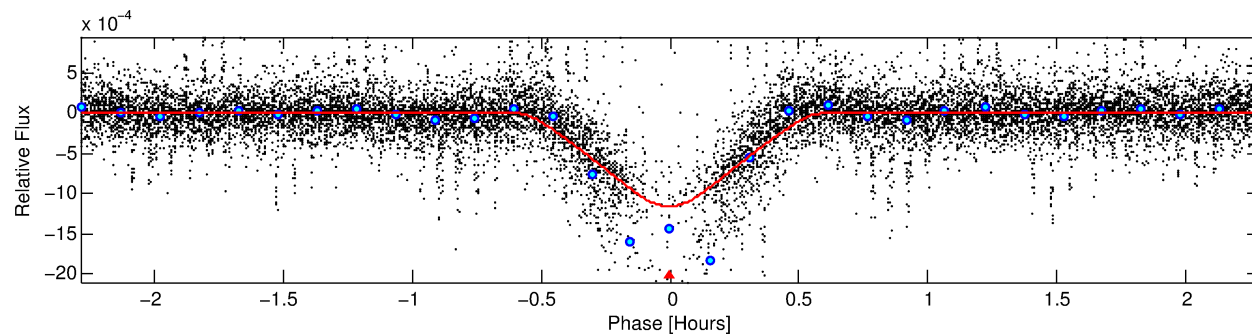
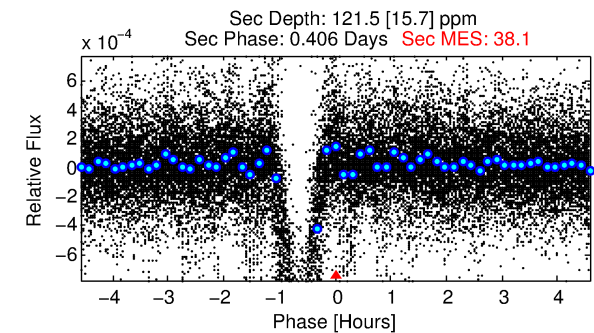
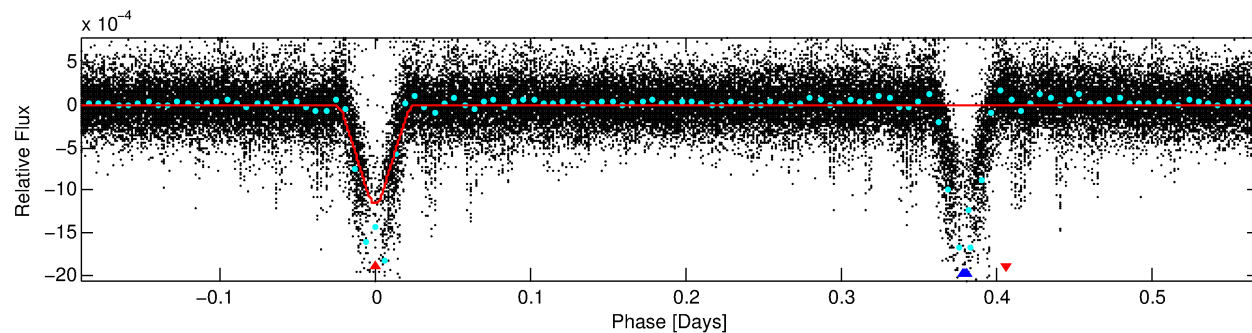
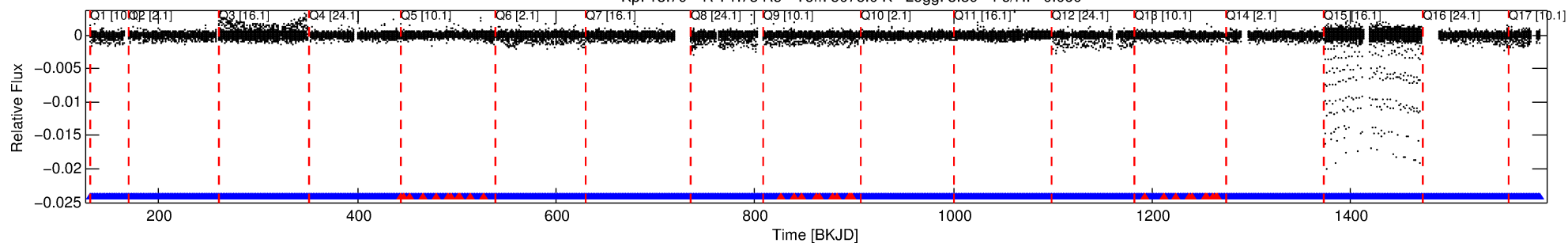
No Significant Match Found

# DV One-Page Summary

KIC: 3233043 Candidate: 1 of 2 Period: 0.759 d

KOI: K00966 Corr: No Ephemeris Match

Kp: 13.79 R\*: 1.78 Rs Teff: 5075.0 K Logg: 3.89 Fe/H: -0.060



## DV Fit Results:

Period = 0.75893 [0.00000] d  
Epoch = 131.5417 [0.0001] BKJD  
Rp/R\* = 0.0393 [0.0019]  
a/R\* = 3.96 [0.62]  
b = 0.91 [0.03]  
Seff = 7617.36 [8926.88]  
Teq = 2382 [698] K  
Rp = 7.64 [4.90] Re  
a = 0.0157 [0.0109] AU  
Ag = 0.28 [0.33] [-2.14σ]  
Teffp = 2689 [135] K [0.43σ]

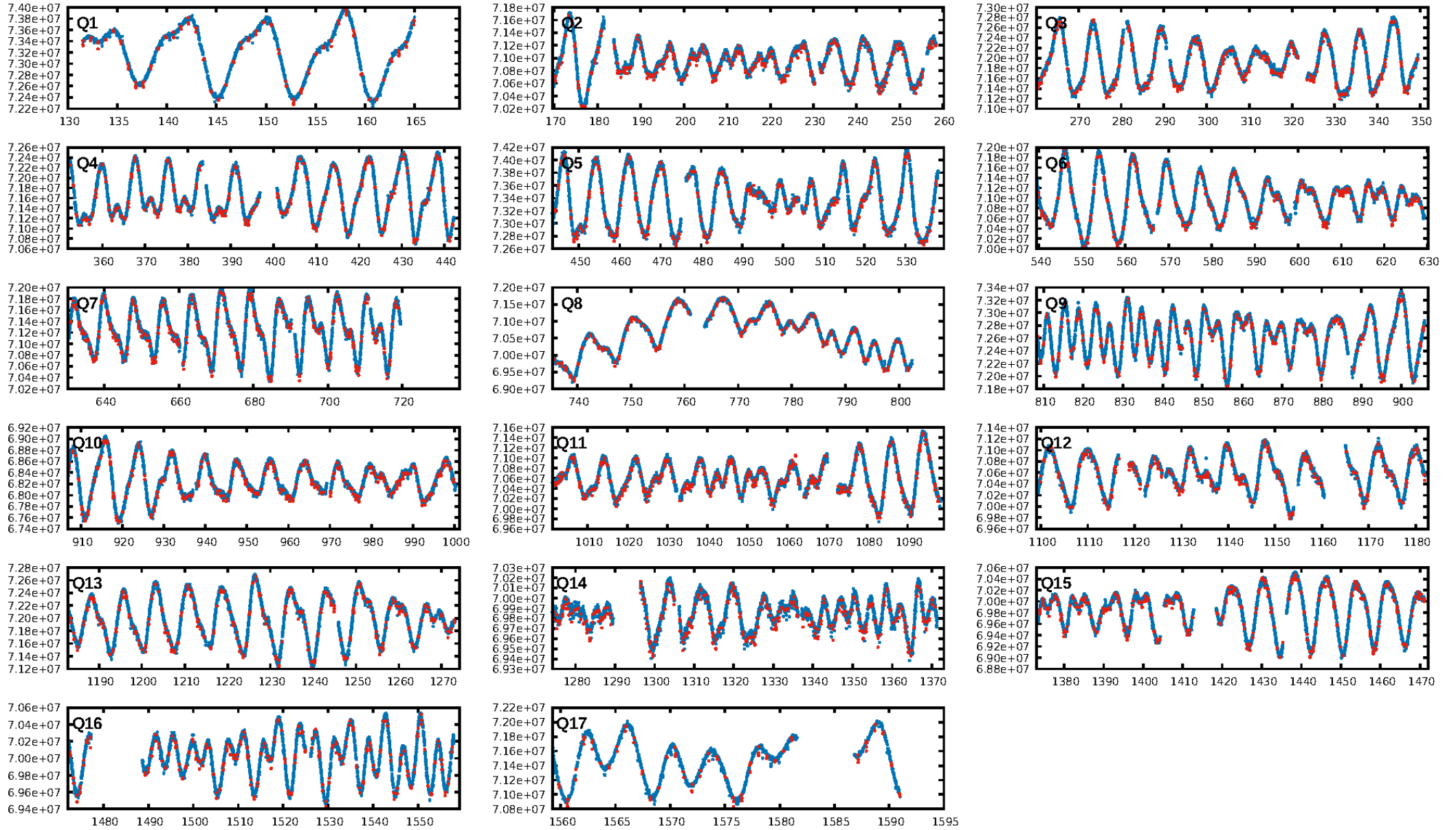
## DV Diagnostic Results:

ShortPeriod-sig: N/A  
LongPeriod-sig: 0.0% [0.00σ]  
ModelChiSquare2-sig: N/A  
ModelChiSquareGof-sig: N/A  
Bootstrap-pfa: 1.22e-294  
RollingBand-fgt: 0.98 [1653/1685]  
GhostDiagnostic-chr: 1.961  
Centroid-sig: 0.0%  
Centroid-so: 0.452 arcsec [8.61σ]  
OotOffset-rm: 0.338 arcsec [4.51σ]  
KicOffset-rm: 0.317 arcsec [4.11σ]  
OotOffset-st: 4/4/4/5 [17]  
KicOffset-st: 4/4/4/5 [17]  
DiffImageQuality-fgm: 1.00 [17/17]  
DiffImageOverlap-fno: 1.00 [17/17]

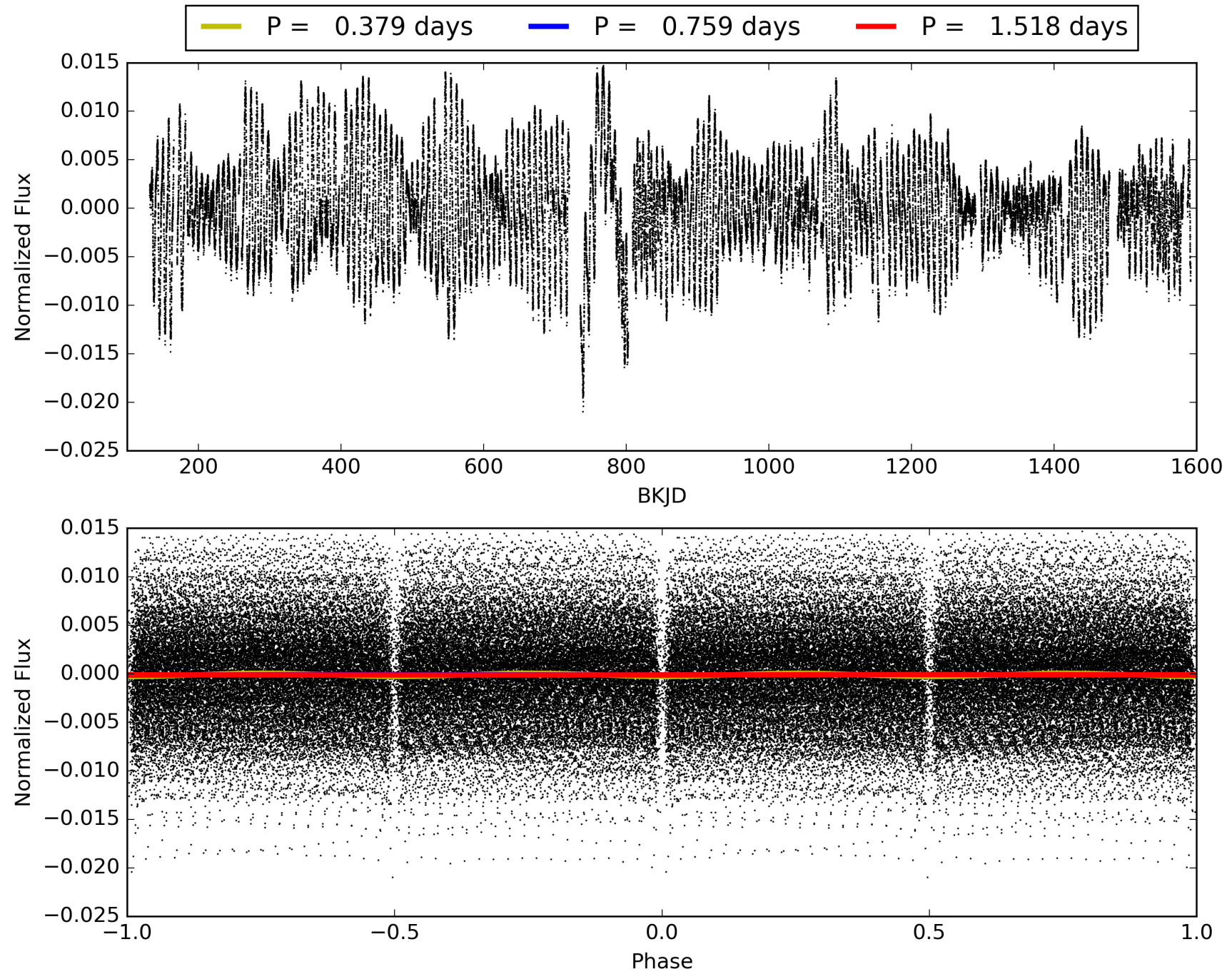
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 03-Feb-2016 04:34:35 Z

This Data Validation Report Summary was produced in the Kepler Science Operations Center Pipeline at NASA Ames Research Center

# TCE 003233043-01, PDC Light Curves

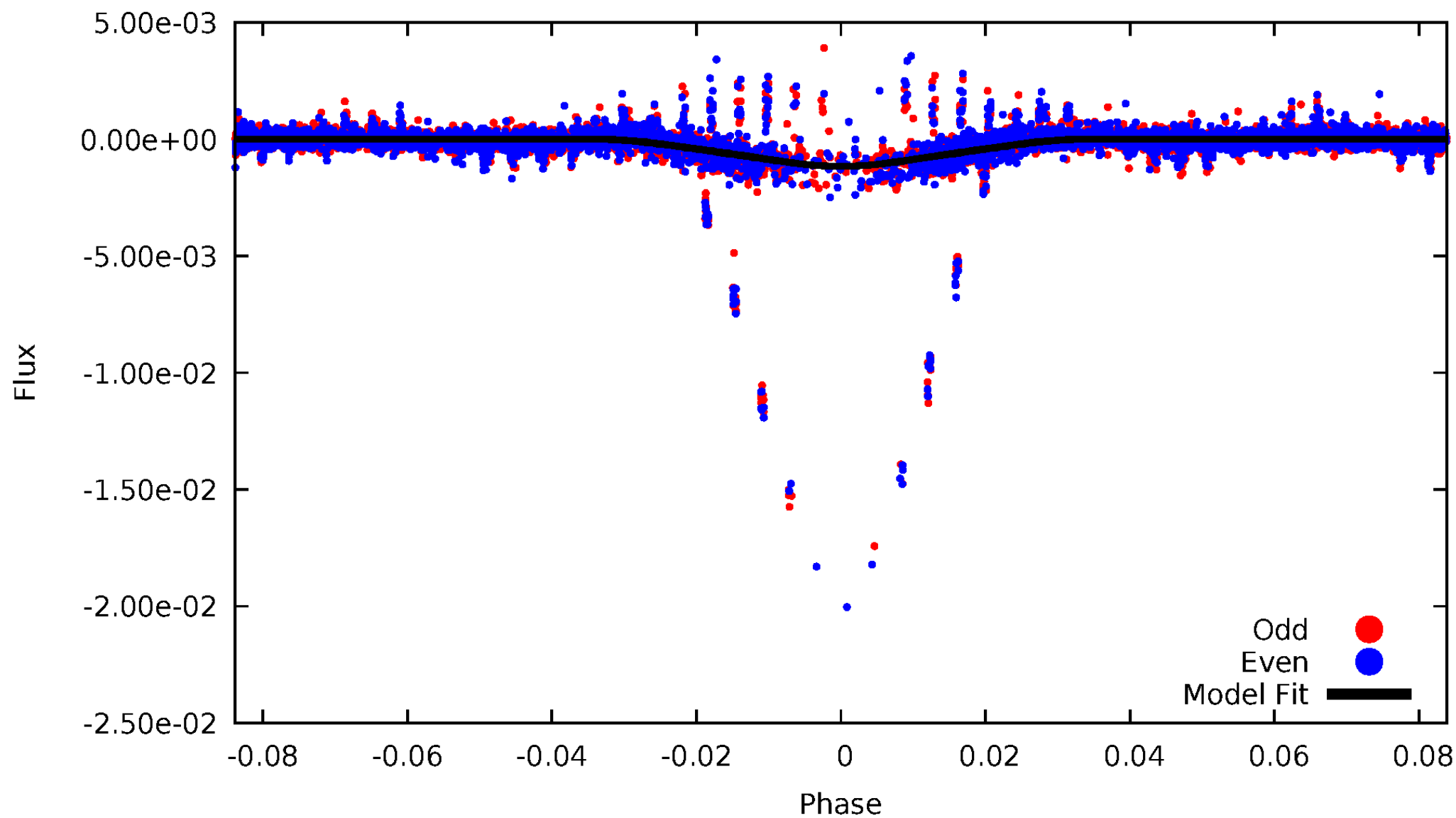


TCE 003233043-01



# DV Odd/Even

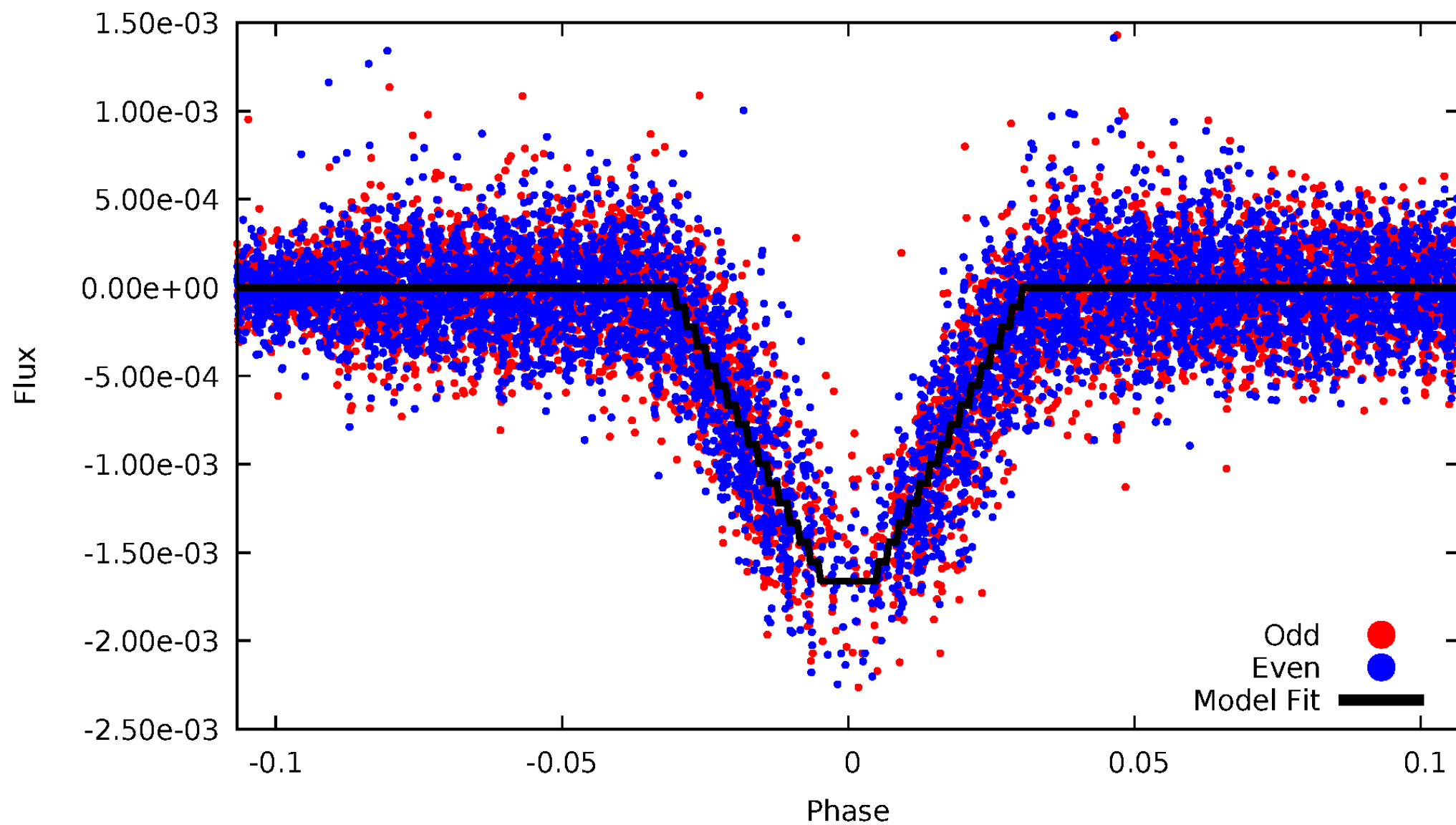
TCE 003233043-01





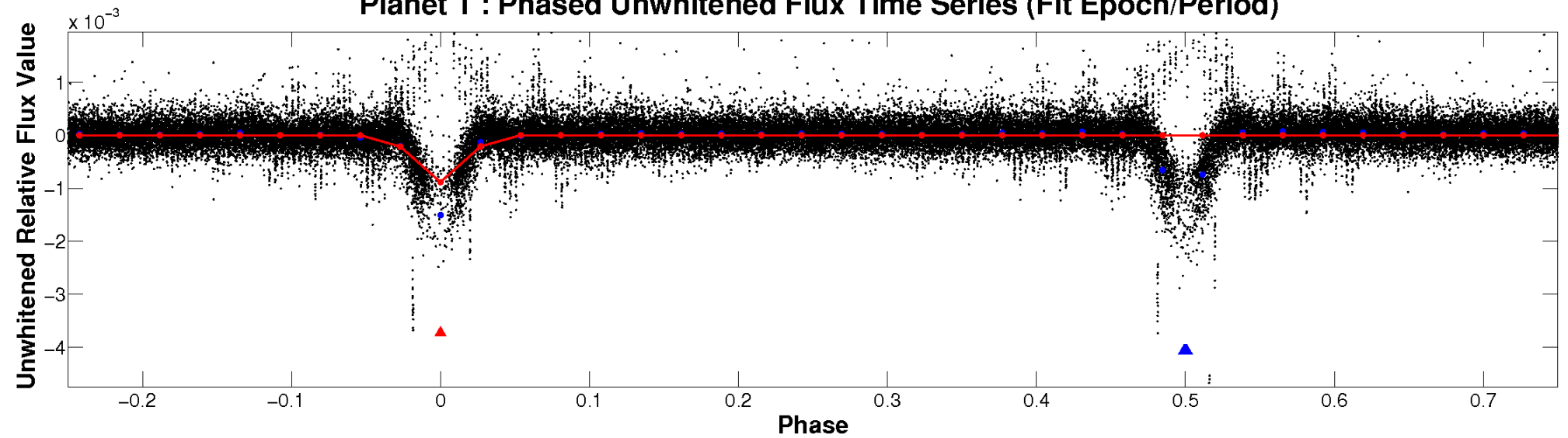
# ALT Odd/Even

TCE 003233043-01

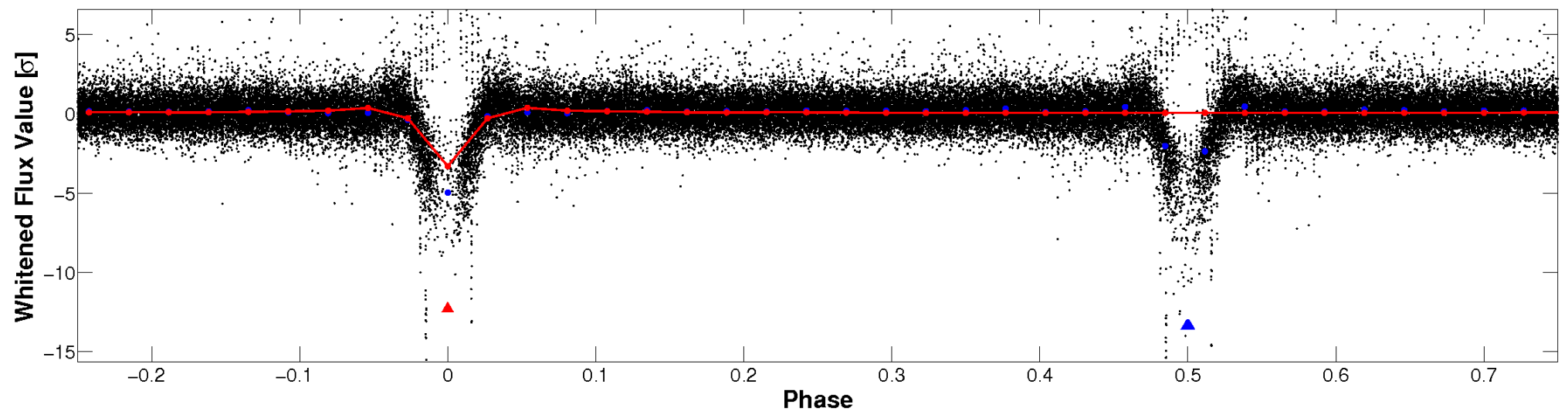


# Non-Whitened Vs. Whitened Light Curve

**Planet 1 : Phased Unwhitened Flux Time Series (Fit Epoch/Period)**

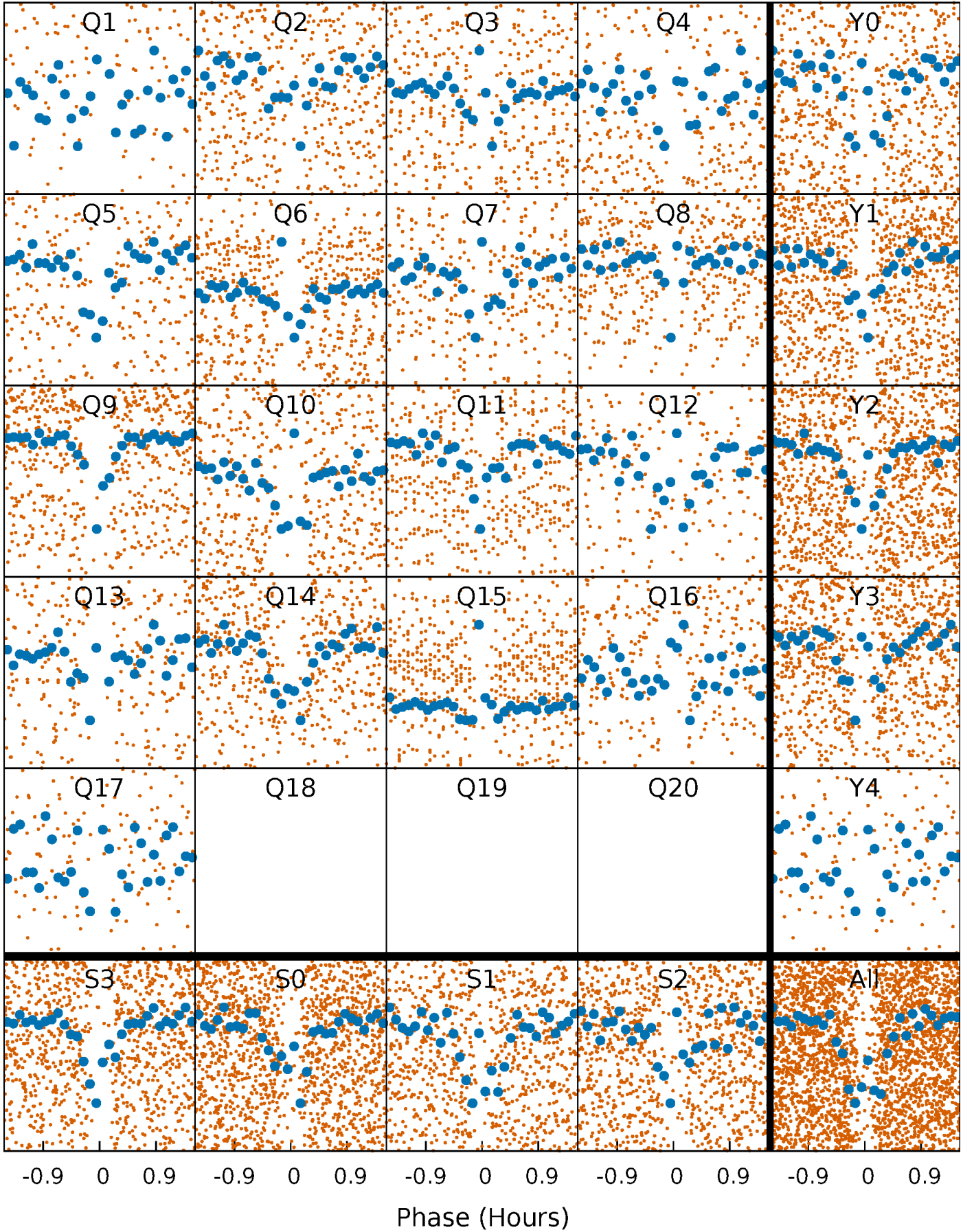


**Planet 1 : Phased Whitened Flux Time Series (Fit Epoch/Period)**



# PDC Quarter-Phased Transit Curves

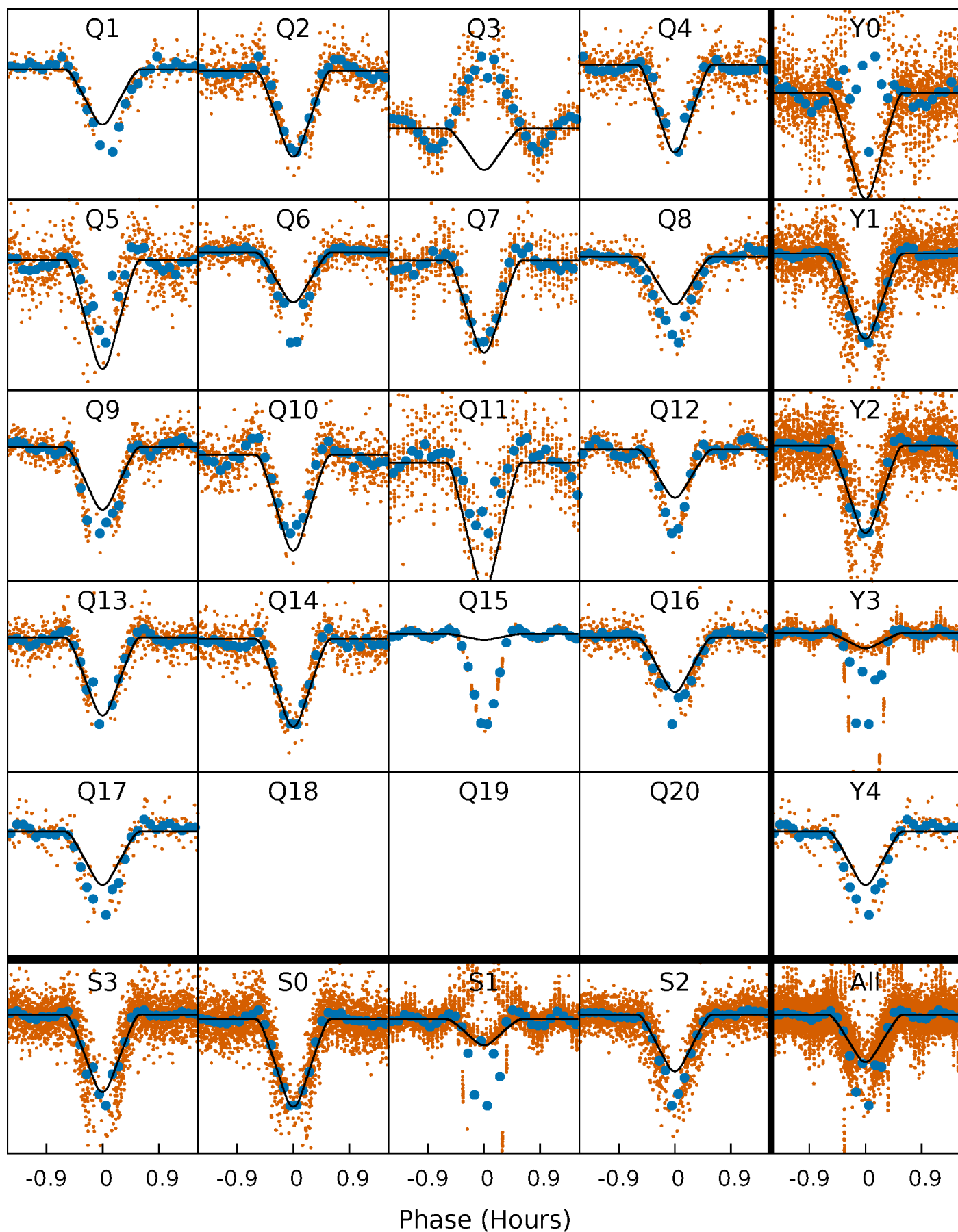
TCE 003233043-01 P= 0.758929 Days  $T_0=131.541689$  (BKJD)





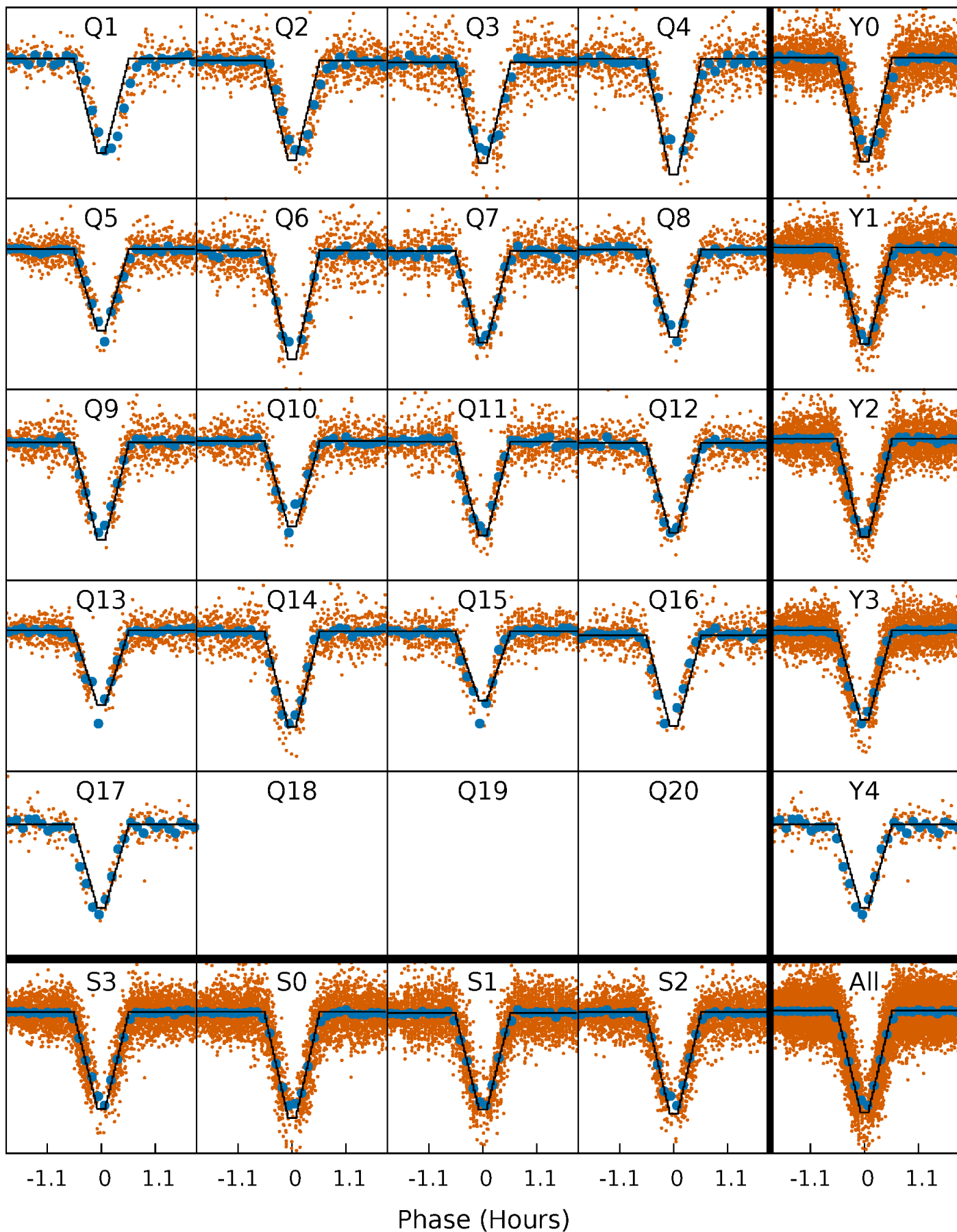
# DV Quarter-Phased Transit Curves

TCE 003233043-01 P= 0.758929 Days  $T_0=131.541689$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

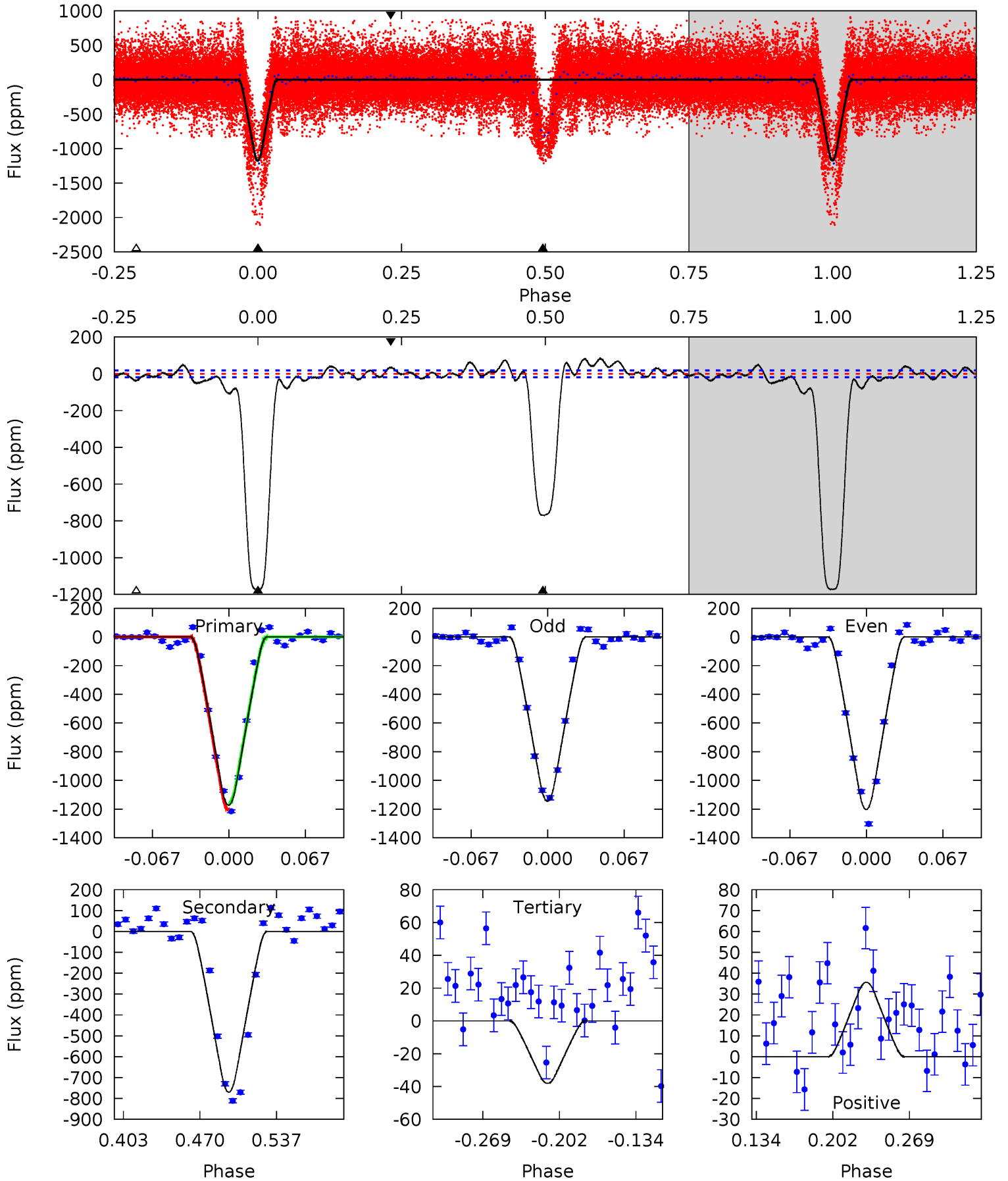
TCE 003233043-01 P= 0.758932 Days  $T_0=131.538542$  (BKJD)



# DV Model-Shift Uniqueness Test

003233043-01, P = 0.758929 Days, E = 130.782760 Days

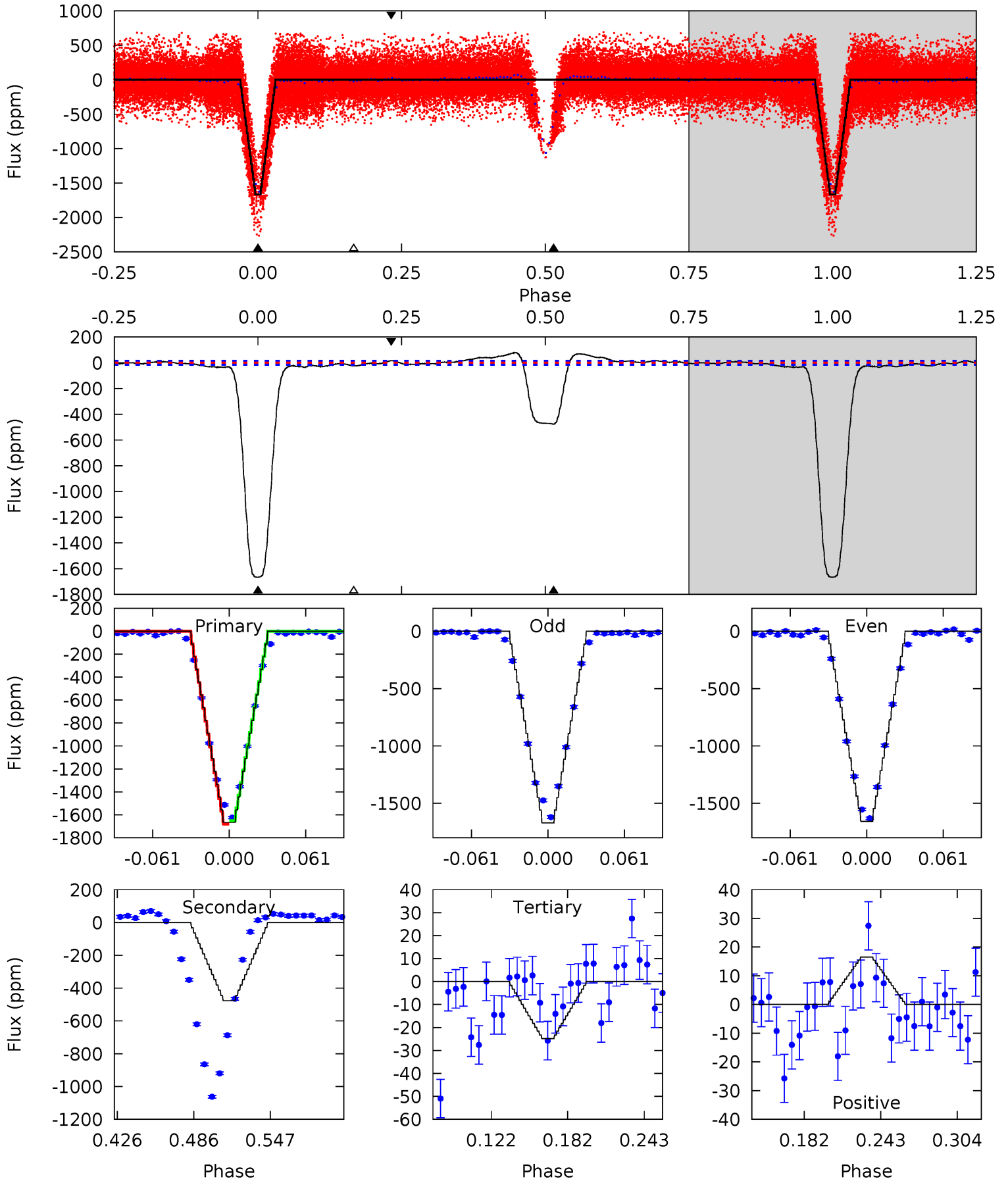
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
289.7	190.2	9.41	8.80	4.65	1.83	6.84	280.3	280.9	180.8	181.4	7.13	1.04	0.07	5.78



# Alt Model-Shift Uniqueness Test

003233043-01, P = 0.758932 Days, E = 130.779610 Days

Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
506.7	144.9	7.57	5.03	4.67	1.88	7.12	499.2	501.7	137.4	139.9	2.13	1.03	0.04	4.73



### Stellar Parameters For KIC 003233043

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	$5075^{+136}_{-151}$	$3.892^{+0.707}_{-0.303}$	$-0.060^{+0.300}_{-0.300}$	$1.783^{+1.035}_{-1.139}$	$0.905^{+0.166}_{-0.149}$	$0.225^{+2.558}_{-0.141}$
	+3%/-3%	+18%/-8%	+500%/-500%	+58%/-64%	+18%/-16%	+1137%/-62%
Source	PHO1	KIC0	KIC0	DSEP		

KIC = Kepler Input Catalog; PHO = Photometry; SPE = Spectroscopy; AST = Asteroseismology  
 TRA = Transits; DESP = Dartmouth Models; MULT = Multiple Models

### Secondary Eclipse Parameters for KIC 003233043-01 / KOI 0966.01

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{\text{max}} (K)$	$T_{\text{obs}} (K)$	$A_{\text{obs}}$
DV	$-770 \pm 4$	$7.54^{+2.48}_{-2.42}$	$3296^{+477}_{-580}$	$4259^{+158}_{-176}$	$1.894^{+2.100}_{-0.790}$
Alt.	$-477 \pm 3$	$7.73^{+2.51}_{-2.35}$	$3276^{+492}_{-520}$	$3753^{+170}_{-227}$	$1.091^{+1.149}_{-0.463}$

$T_{\text{max}}$  = Theoretical Maximum Planetary Temperature  
 $T_{\text{obs}}$  = Observed Planetary Temperature (Assuming  $A=0.3$ )  
 $A_{\text{obs}}$  = Observed Albedo (Assuming  $T=0$ )

If a secondary eclipse is present, the system is likely an EB if  $T_{\text{obs}} \gg T_{\text{max}}$  AND  $A_{\text{obs}} \gg 1.0$



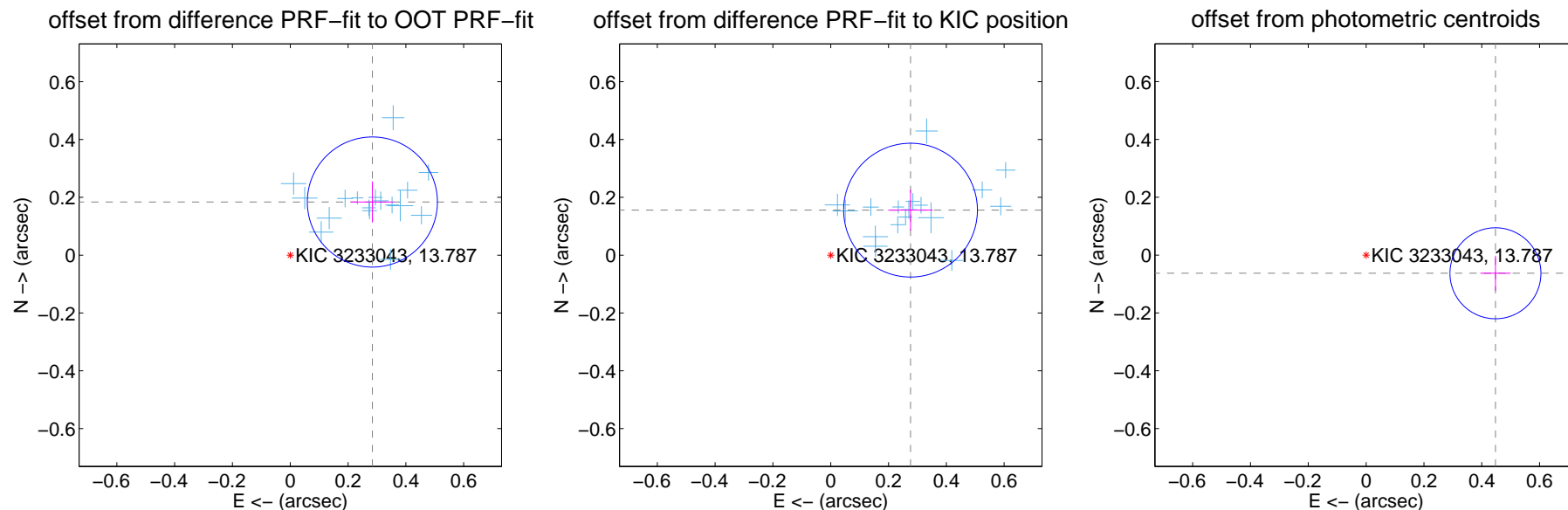
## DV Centroid Data

Supplemental centroid analysis for 003233043-01. Kepler magnitude: 13.79. Transit SNR 99.02

There are 17 quarters with good PRF difference image offsets

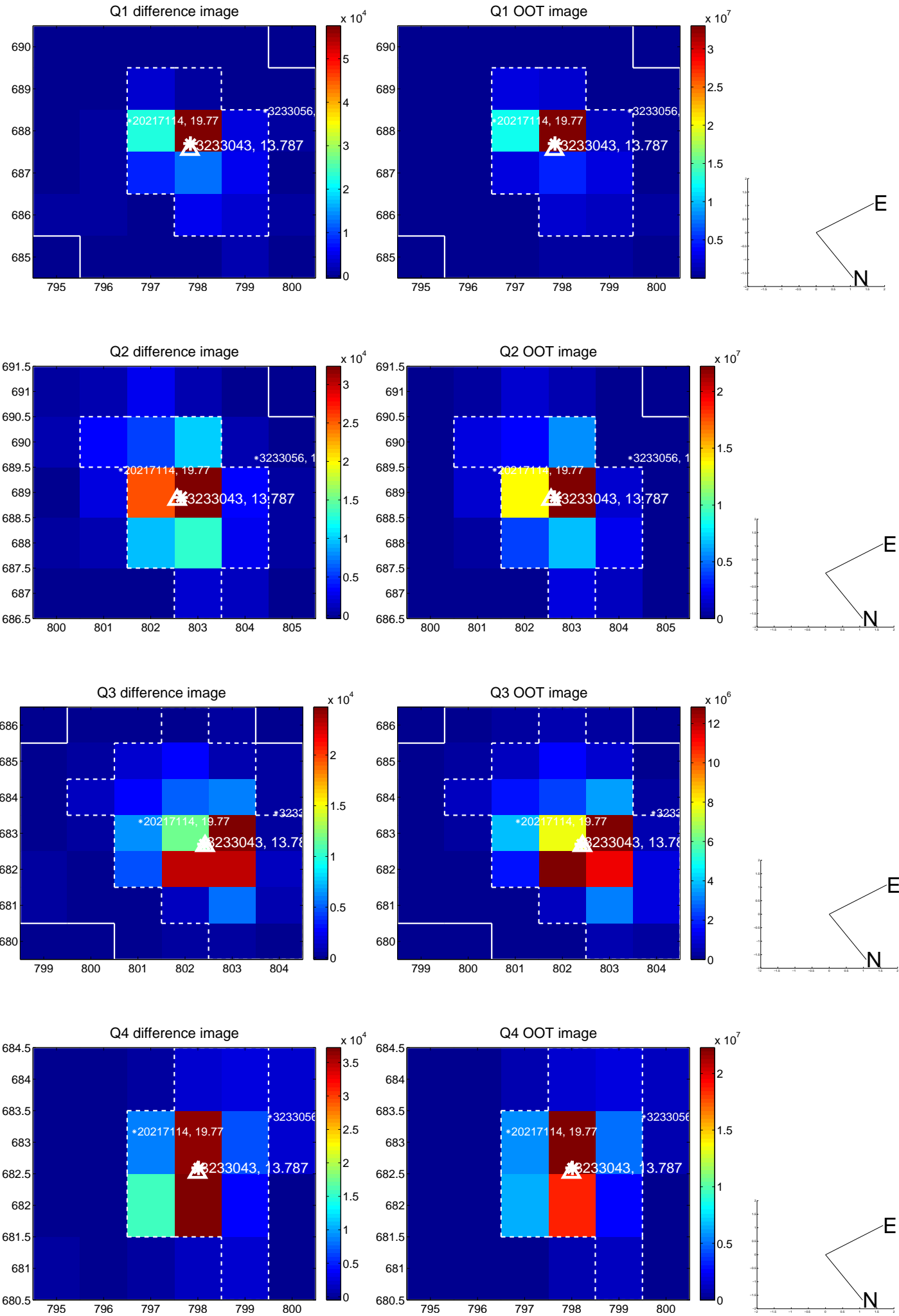
The direct PRF centroid is offset from the target star catalog position by about 0.05 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$0.338 \pm 0.075$	4.51	$-0.284 \pm 0.075$	$0.184 \pm 0.071$
PRF-fit source offset from KIC position	$0.317 \pm 0.077$	4.11	$-0.276 \pm 0.077$	$0.156 \pm 0.071$
photometric centroid source offset	$0.45 \pm 0.05$	8.61	$-0.45 \pm 0.05$	$-0.06 \pm 0.06$

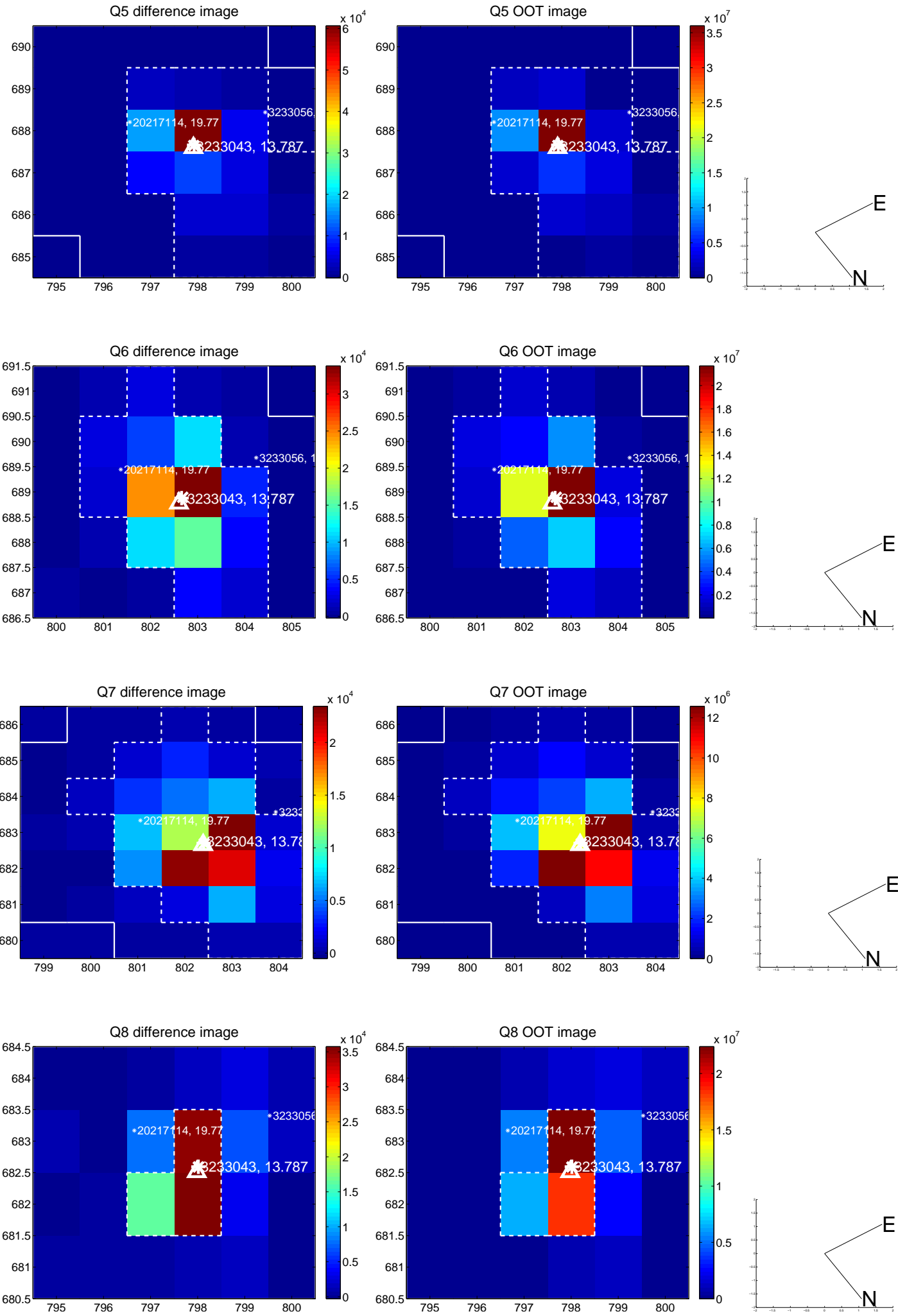


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses:** good quarterly centroid offsets; **Vermillion crosses:** bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: three- $\sigma$ . Red \*: target star. Blue \*: Other stars. Text next to a star gives its KIC ID and kepmag. KIC IDs > 15,000,000 are from the UKIRT catalog.

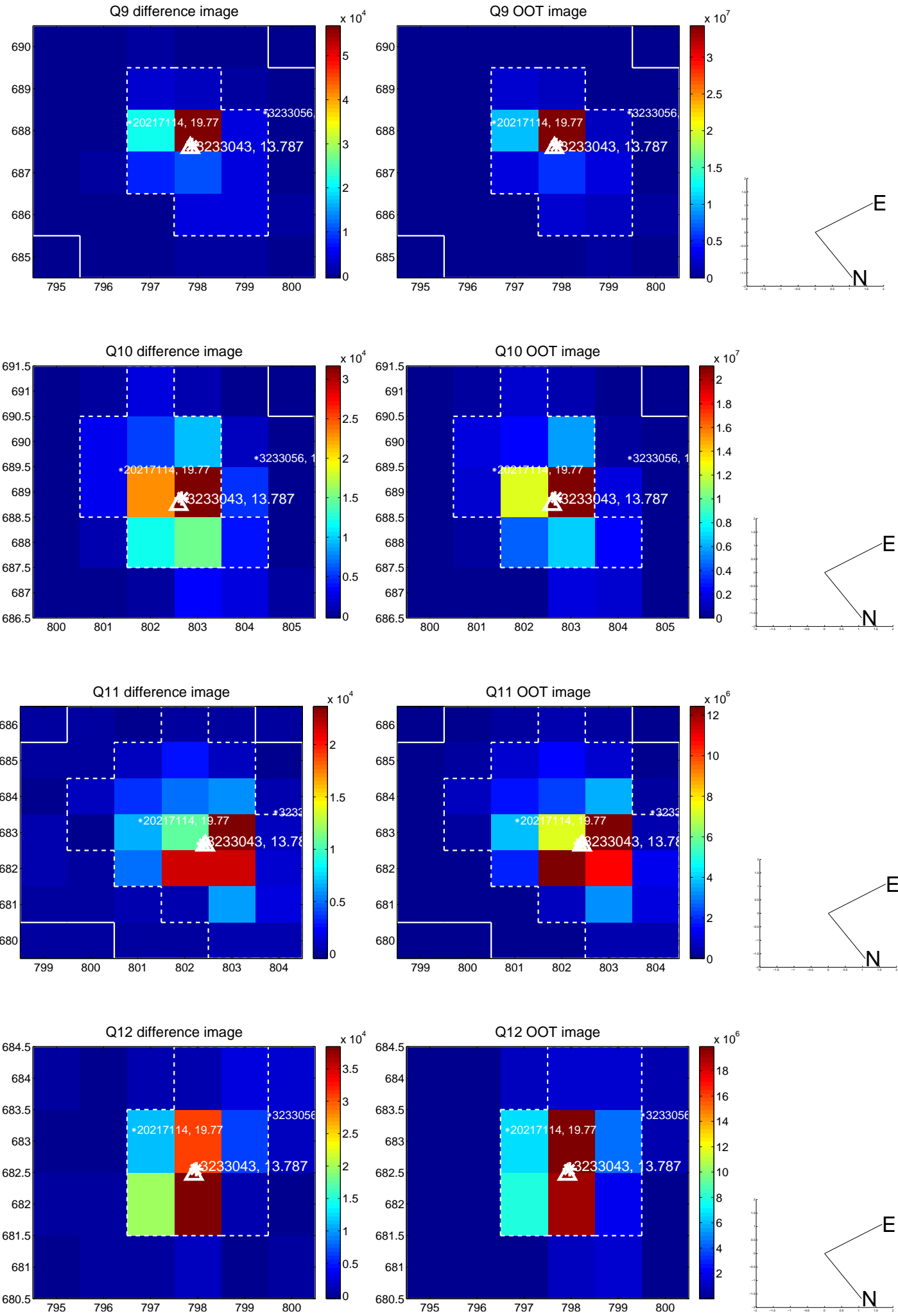
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



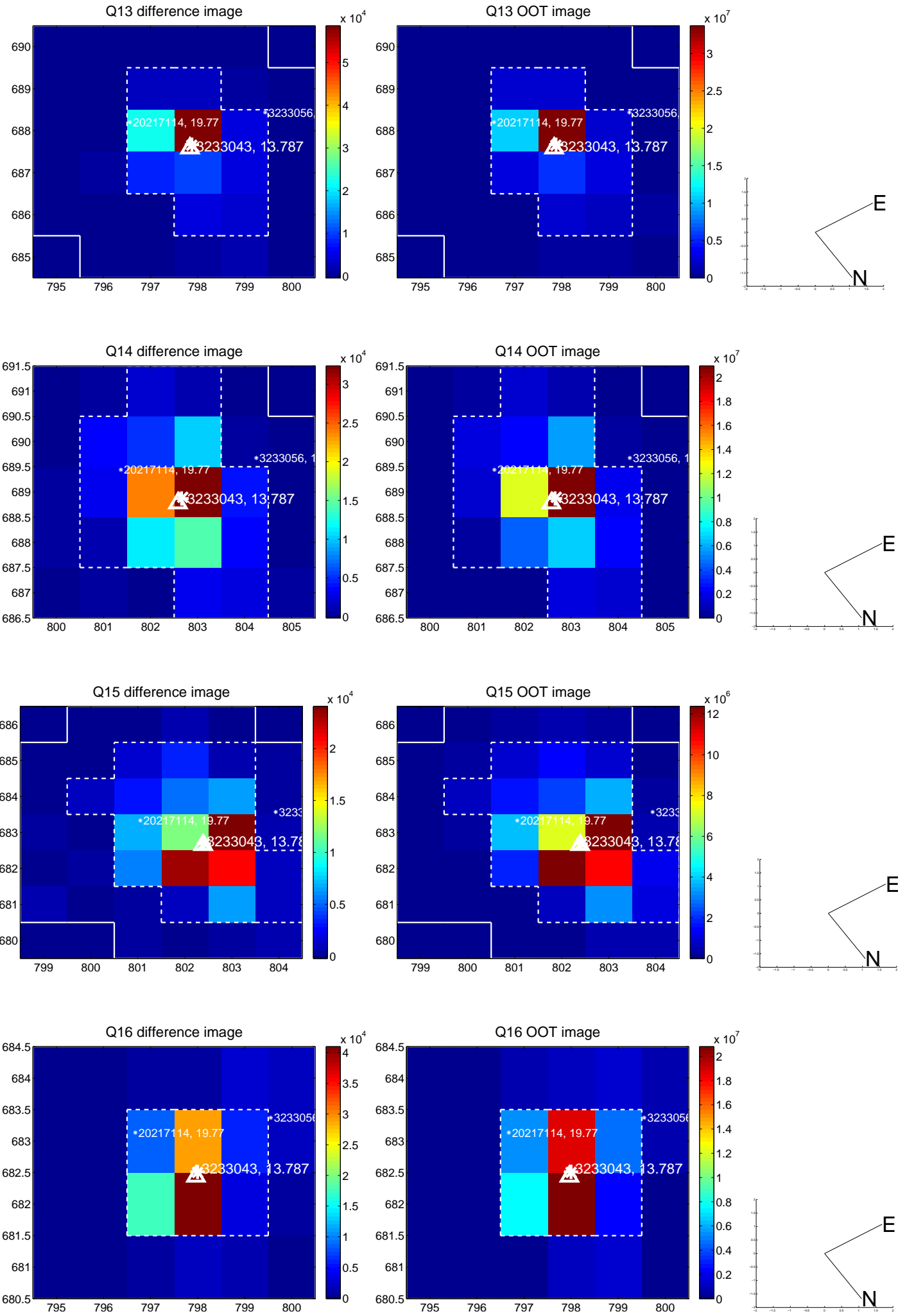
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.

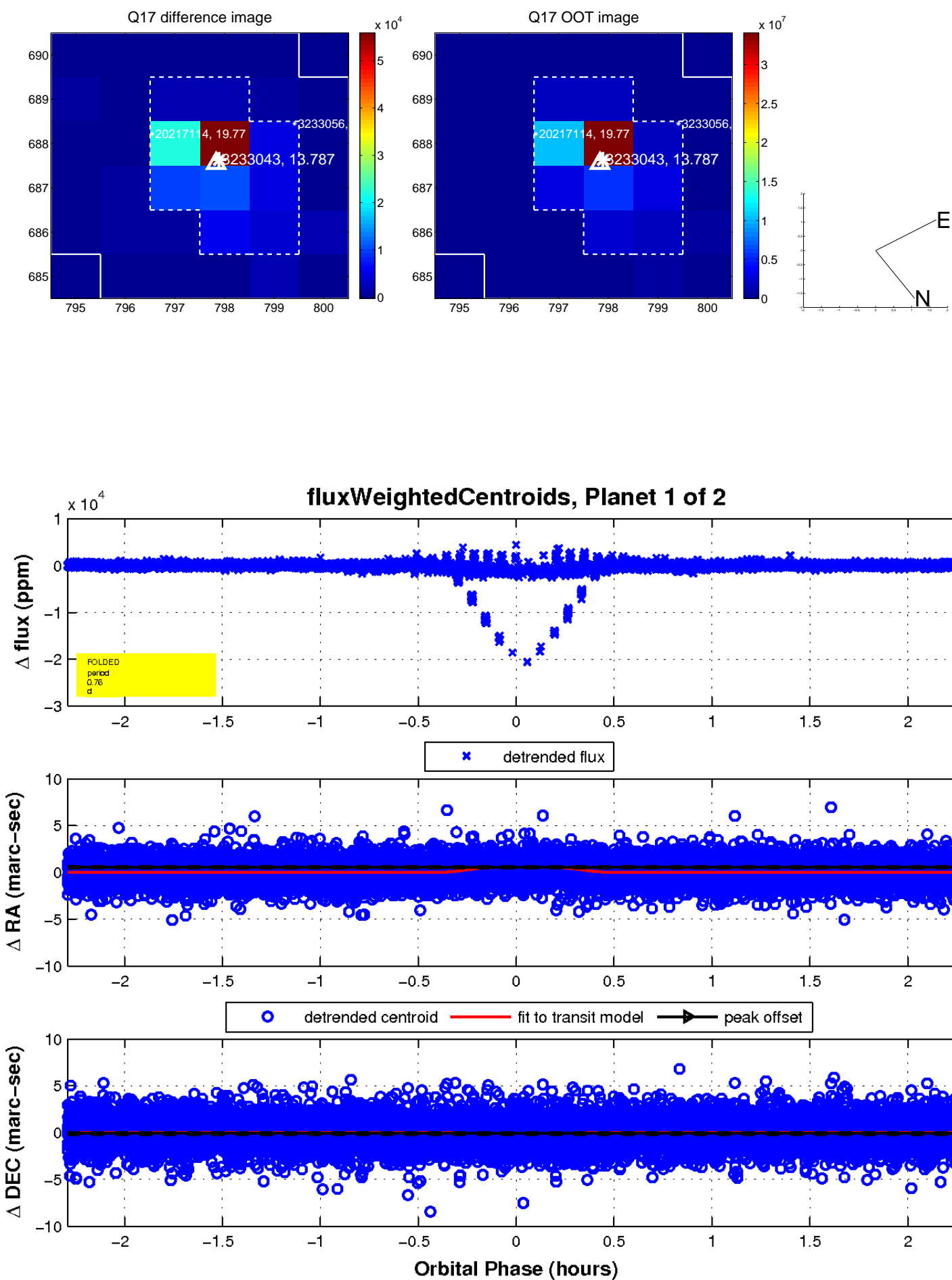


white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



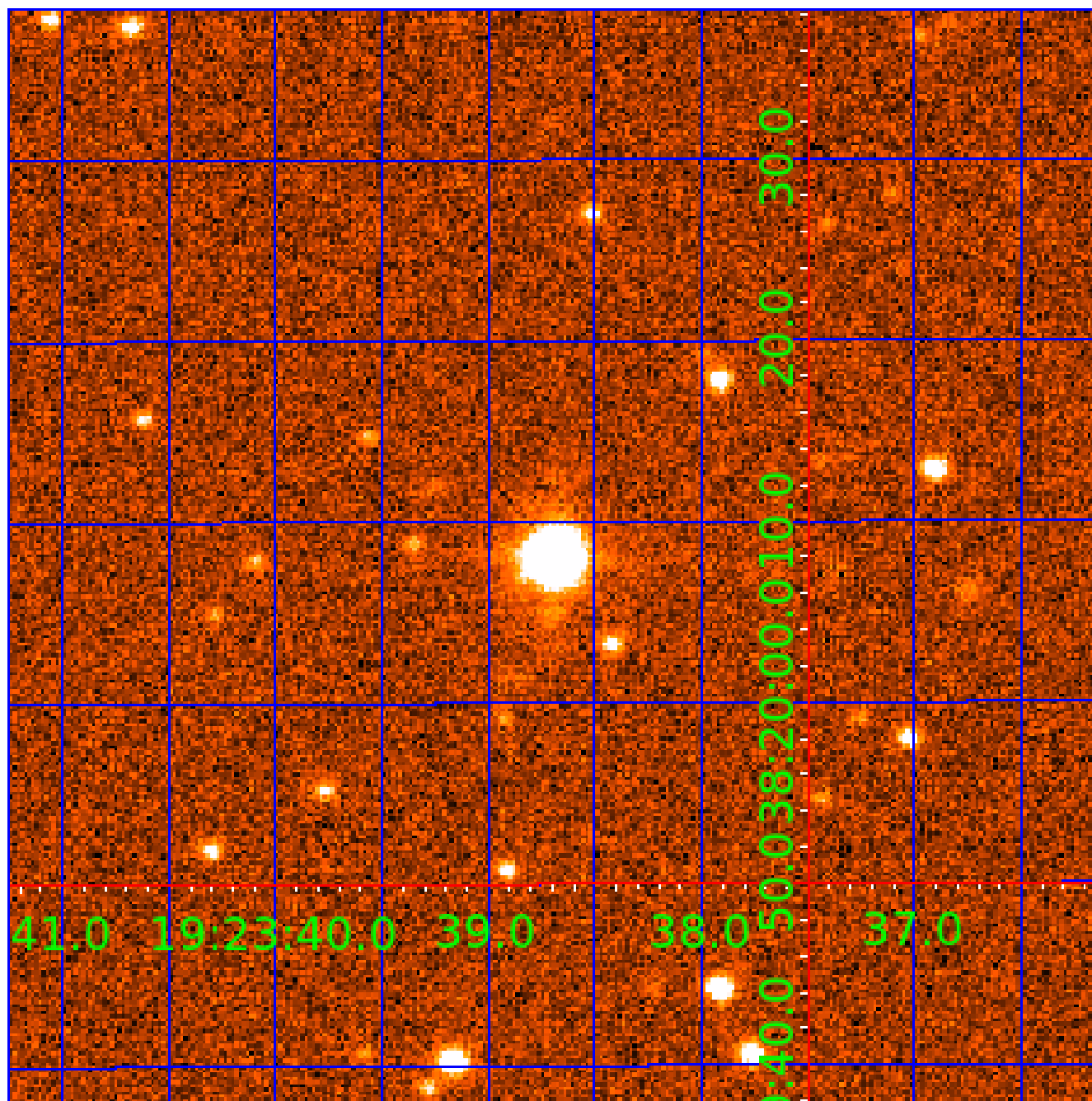


white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



# UKIRT Image

Declination



# KIC 003233043

## Q1-17 DR25 TCE Parameters

TCE	Run Type	KOI?	Period (Days)	Epoch (BKJD)	Depth (ppm)	Duration (Hours)	MES	SNR	$R_{\star}$ ( $R_{\odot}$ )	$T_{\star}$ (K)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
003233043-01	OBS	0966.01	0.758929	131.541689	1155.0	0.763	37.2	99.0	1.78	5075	7.64	7617.36
003233043-02	OBS	No	0.758930	131.920507	1256.1	0.707	95.7	121.0	1.78	5075	8.09	7617.35

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
003233043-01	OBS	FP	0.00	0	1	0	0	MOD_SEC_DV—MOD_SEC_ALT—HAS_SEC_TCE
003233043-02	OBS	FP	0.00	1	1	0	0	IS_SEC_TCE

**Notes:** OBS = Observed. INJ = Injected. INV = Inverted. SCR = Scrambled.

N = Not Transit-Like. S = Stellar Eclipse. C = Centroid Offset. E = Ephemeris Match.

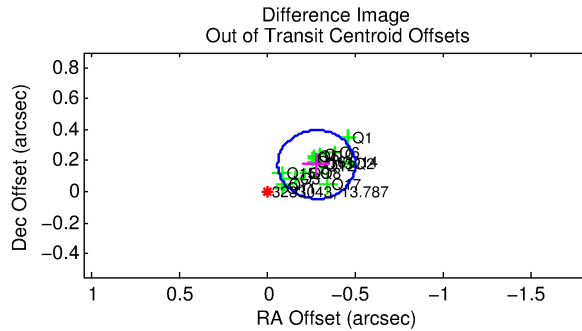
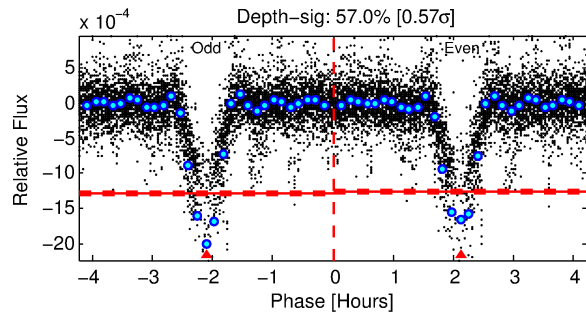
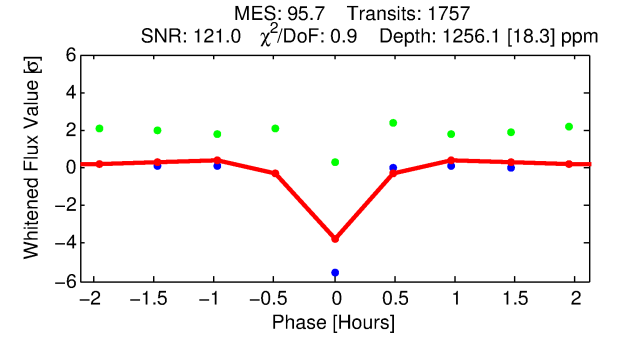
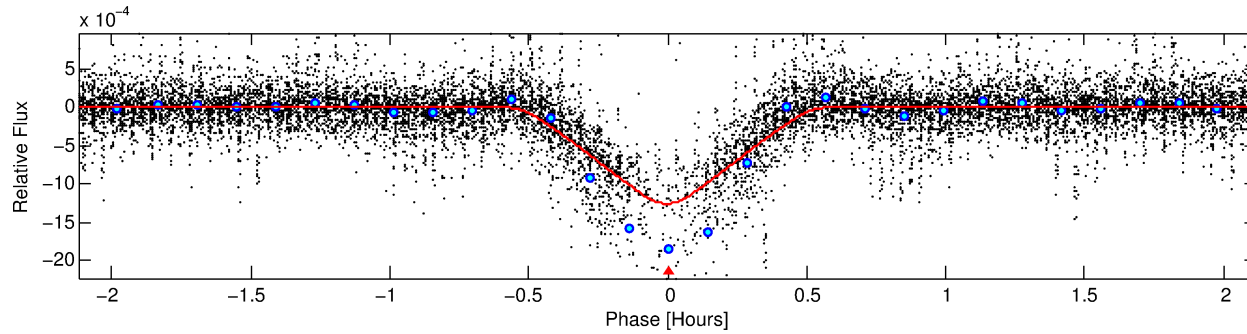
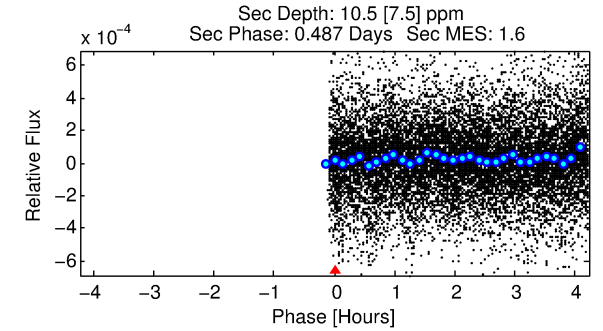
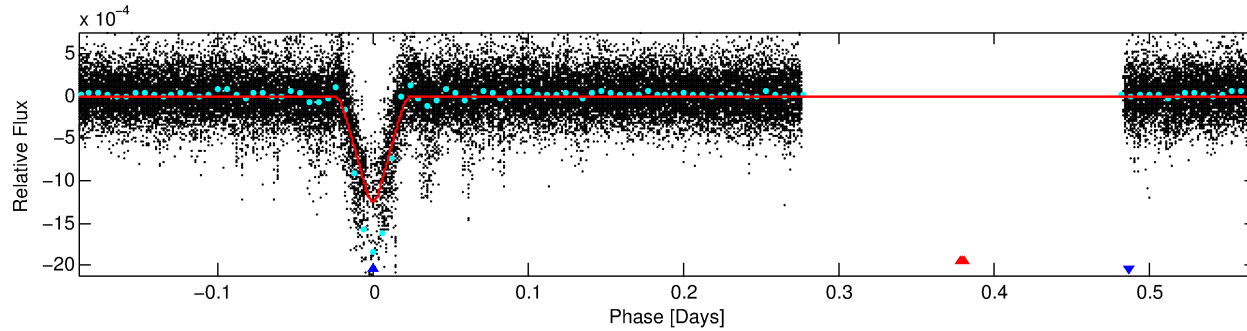
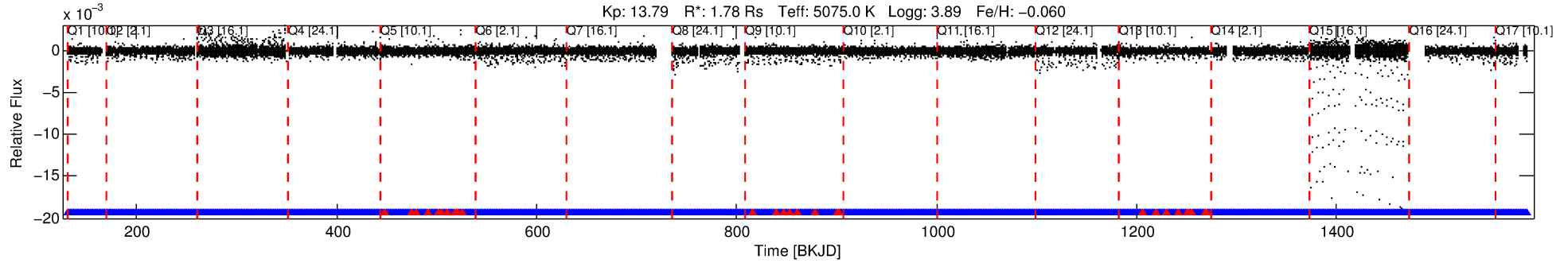
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

## Ephemeris Match Information For 003233043-02

No Significant Match Found

# DV One-Page Summary

KIC: 3233043 Candidate: 2 of 2 Period: 0.759 d  
KOI: K00966 Corr: No Ephemeris Match



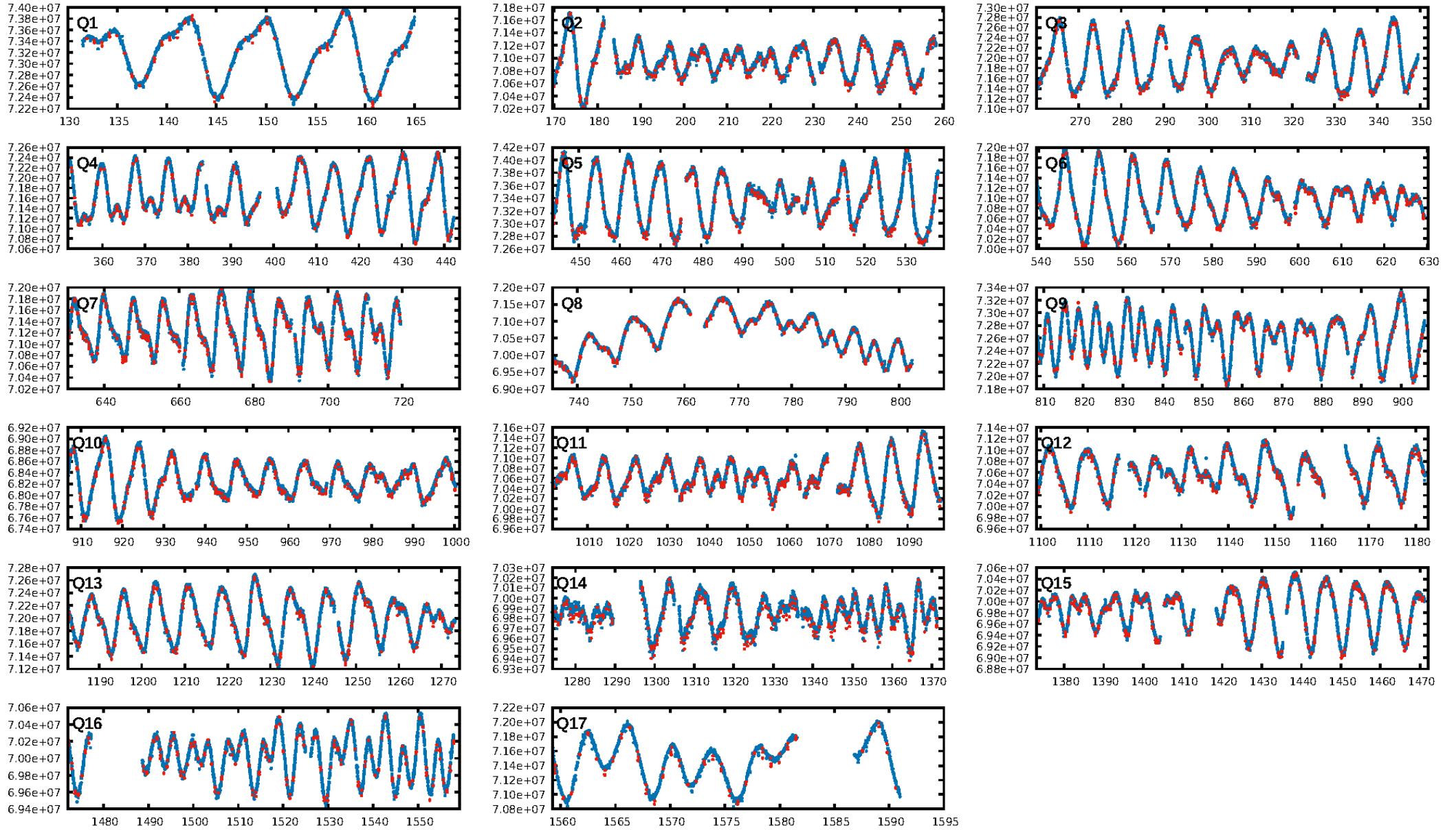
## DV Fit Results:

Period = 0.75893 [0.00000] d  
Epoch = 131.9205 [0.0001] BKJD  
Rp/R\* = 0.0416 [0.0018]  
a/R\* = 4.25 [0.57]  
b = 0.91 [0.03]  
Seff = 7617.35 [8926.87]  
Teq = 2382 [698] K  
Rp = 8.09 [5.18] Re  
a = 0.0157 [0.0109] AU  
Ag = 0.02 [0.03] [-32.65σ]  
Teffp = 1417 [257] K [-1.30σ]

## DV Diagnostic Results:

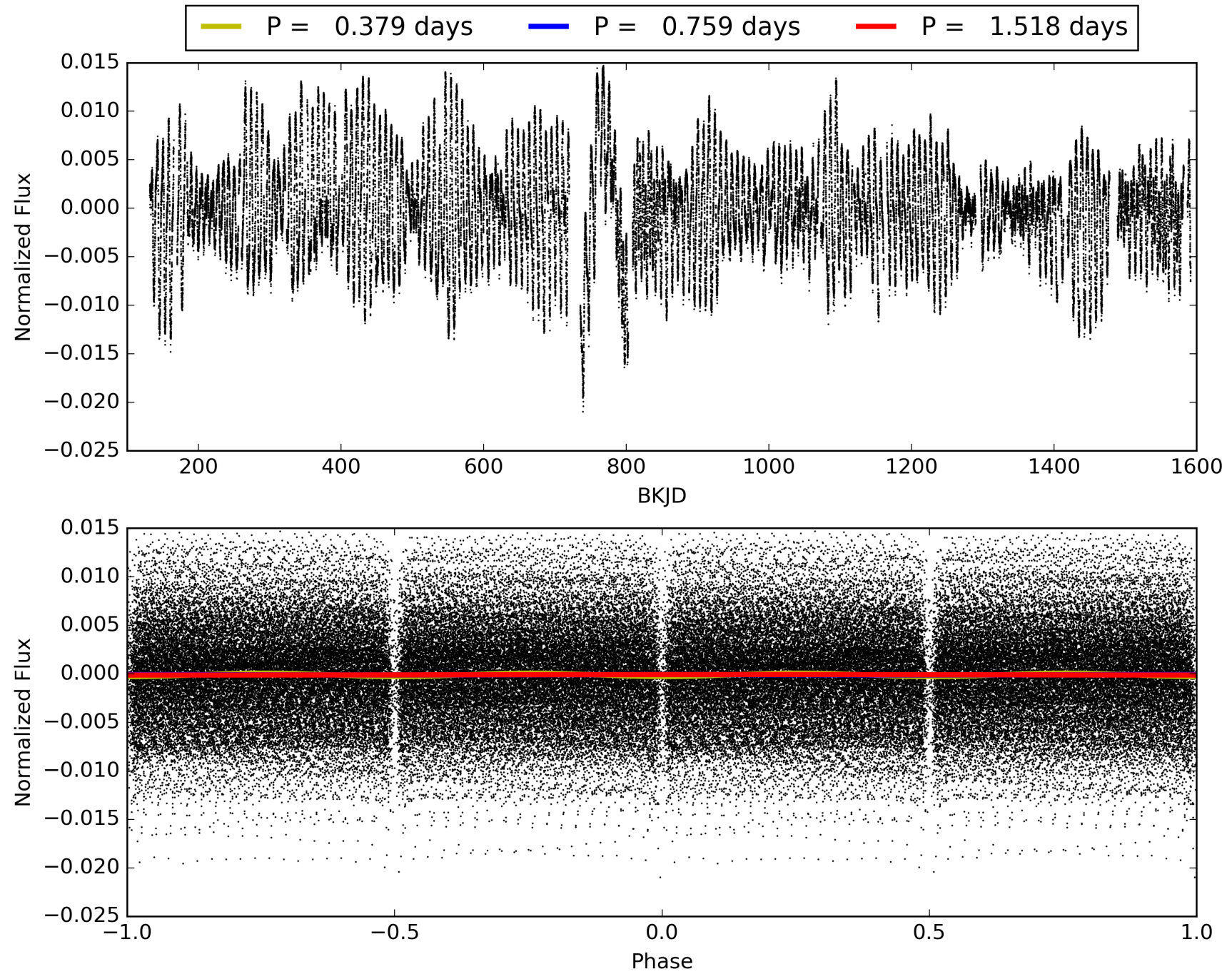
ShortPeriod-sig: 0.0% [0.00σ]  
LongPeriod-sig: N/A  
ModelChiSquare2-sig: N/A  
ModelChiSquareGof-sig: N/A  
Bootstrap-pfa: 0.00e+00  
RollingBand-fgt: 0.98 [1649/1678]  
GhostDiagnostic-chr: 1.771  
Centroid-sig: 0.0%  
Centroid-so: 0.296 arcsec [5.72σ]  
OotOffset-rm: 0.329 arcsec [4.47σ]  
KicOffset-rm: 0.319 arcsec [4.11σ]  
OotOffset-st: 4/4/4/5 [17]  
KicOffset-st: 4/4/4/5 [17]  
DiffImageQuality-fgm: 1.00 [17/17]  
DiffImageOverlap-fno: 1.00 [17/17]

# TCE 003233043-02, PDC Light Curves



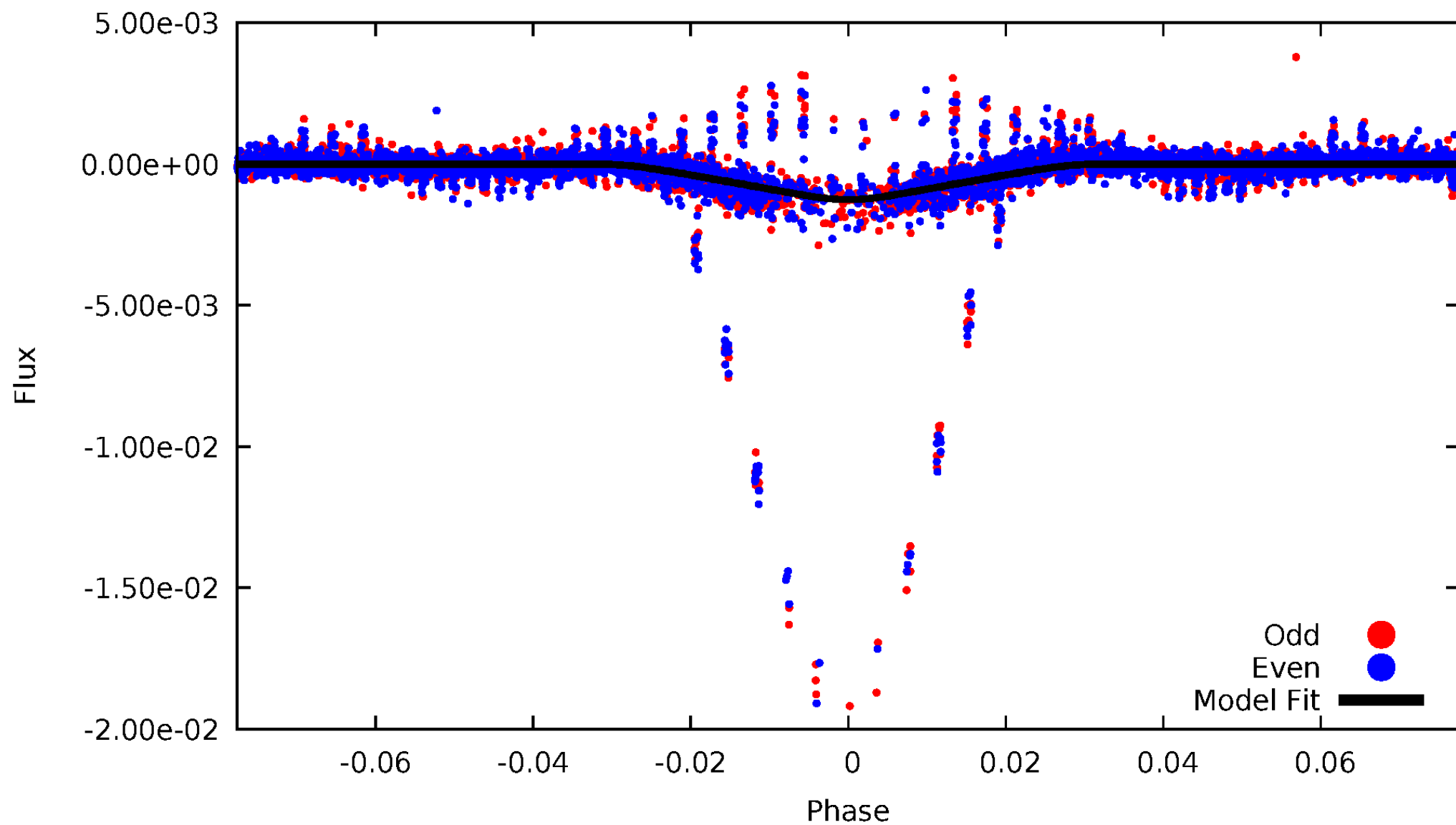


TCE 003233043-02



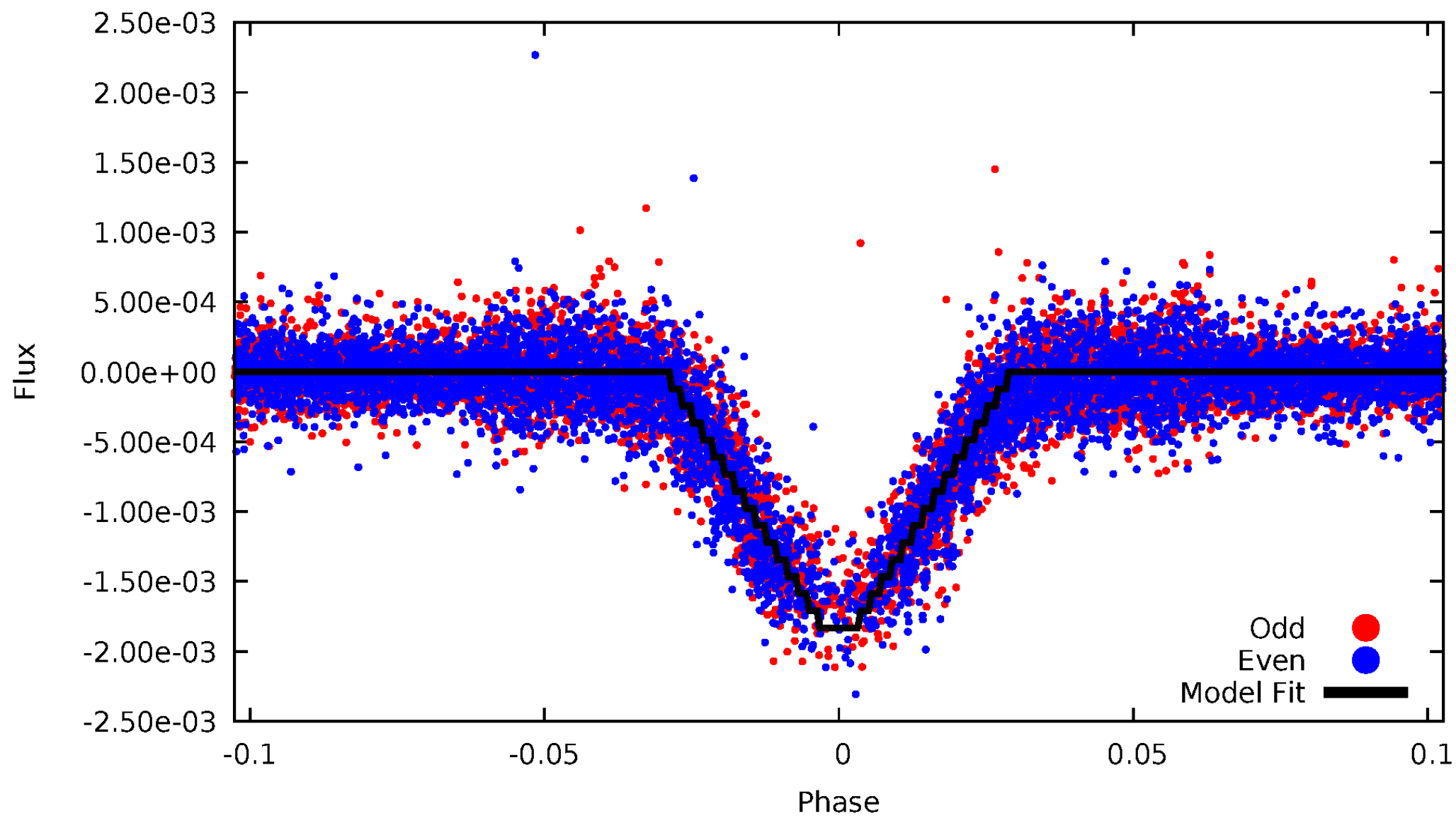
# DV Odd/Even

TCE 003233043-02



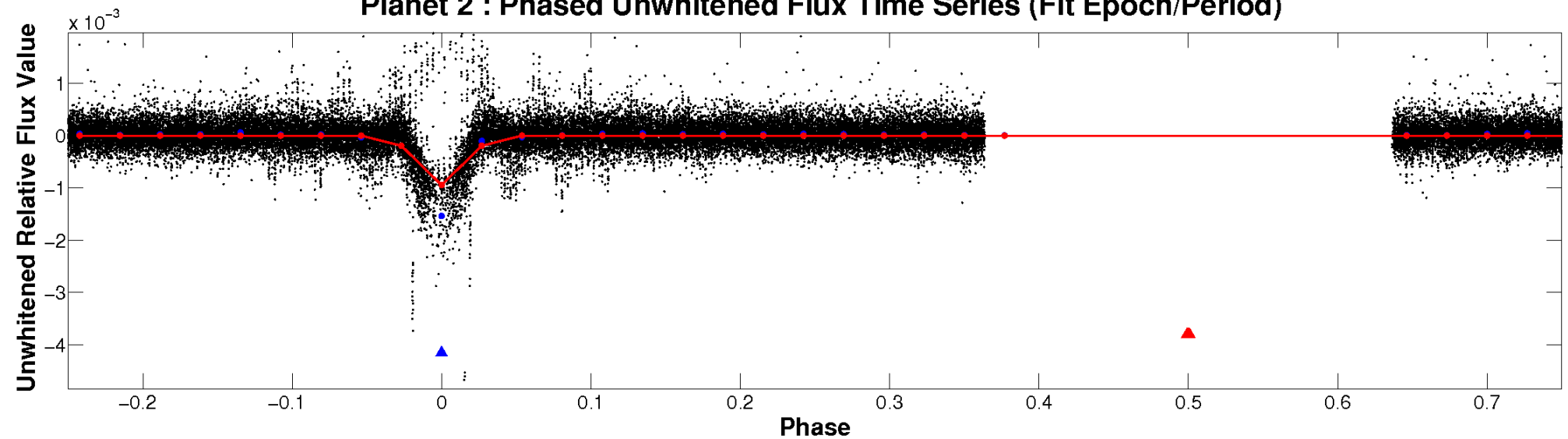
# ALT Odd/Even

TCE 003233043-02

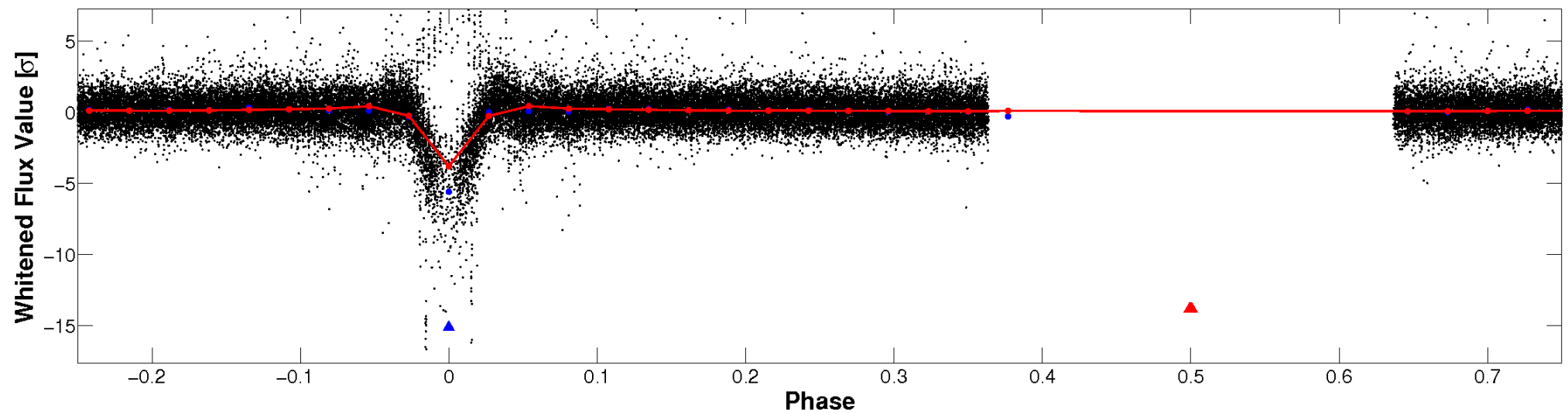


# Non-Whitened Vs. Whitened Light Curve

## Planet 2 : Phased Unwhitened Flux Time Series (Fit Epoch/Period)

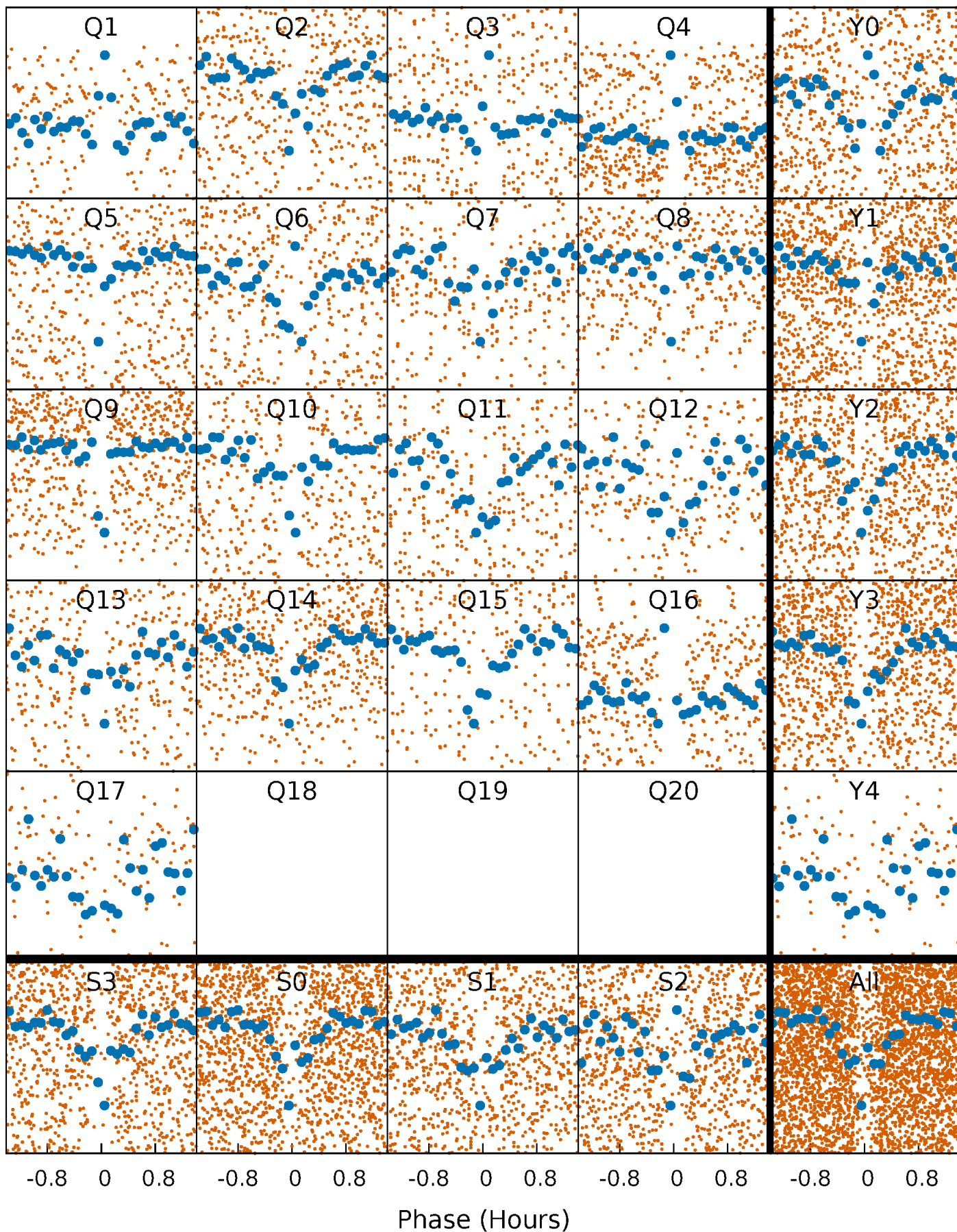


## Planet 2 : Phased Whitened Flux Time Series (Fit Epoch/Period)



# PDC Quarter-Phased Transit Curves

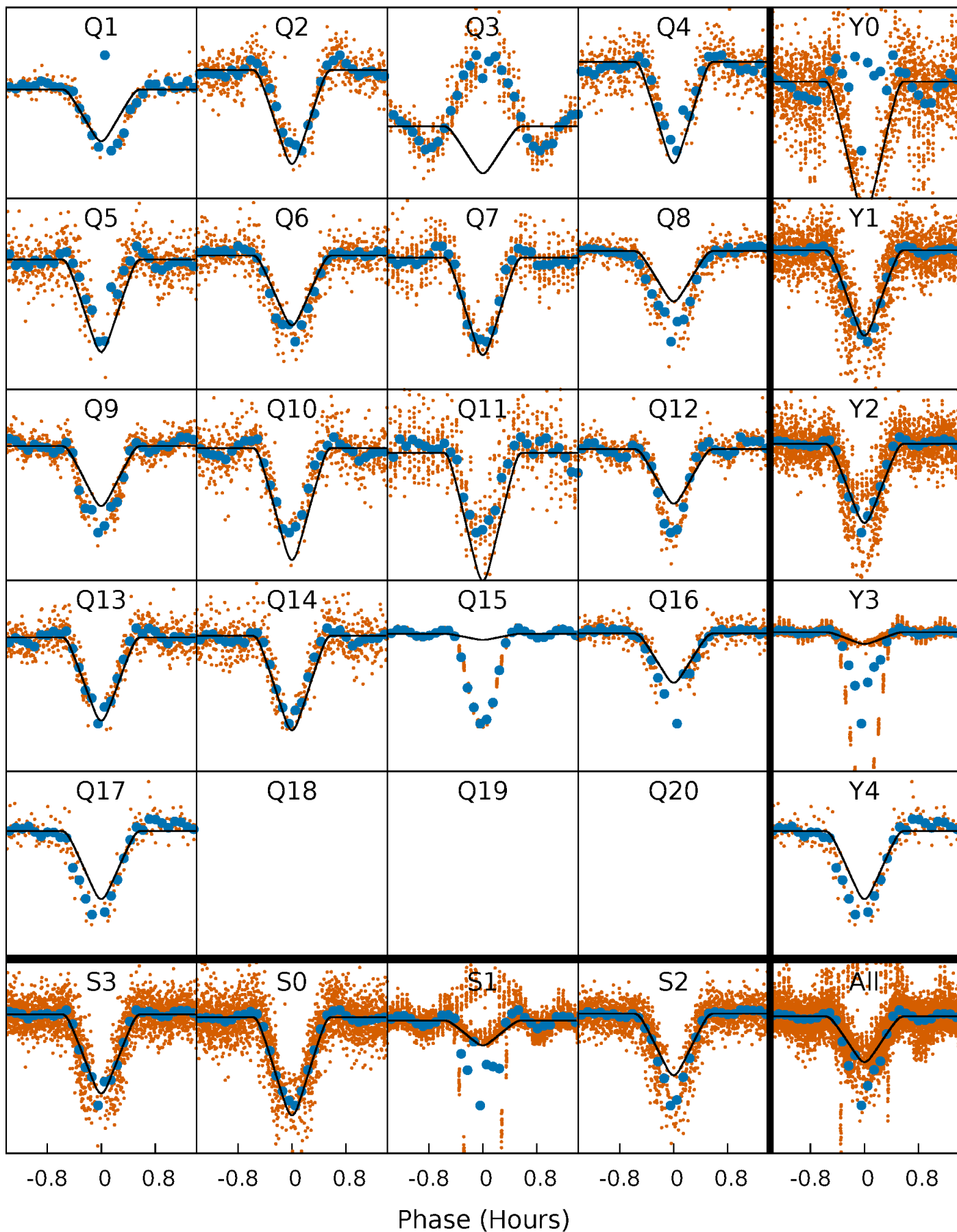
TCE 003233043-02   P= 0.758930 Days    $T_0=131.920507$  (BKJD)





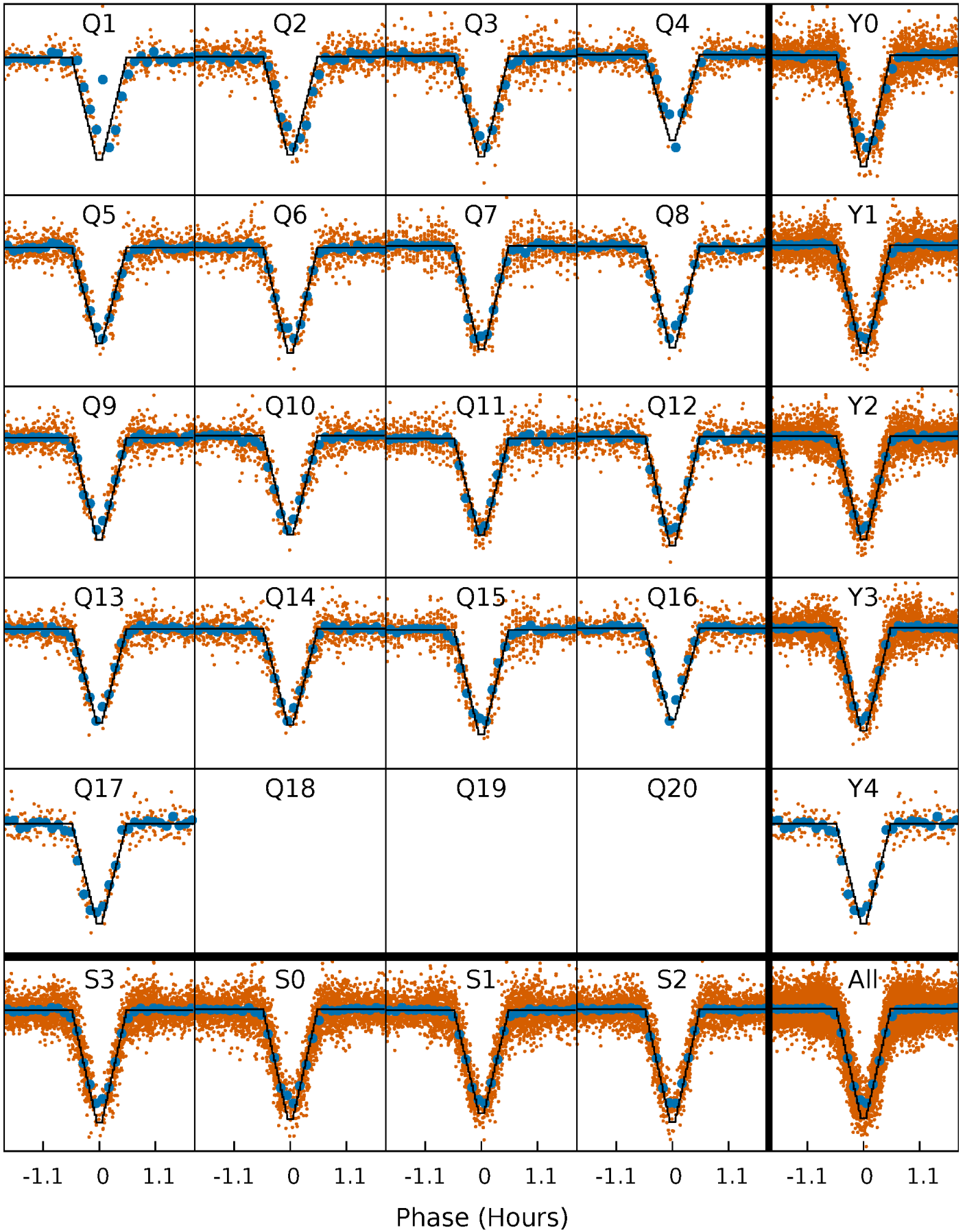
# DV Quarter-Phased Transit Curves

TCE 003233043-02   P= 0.758930 Days    $T_0=131.920507$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

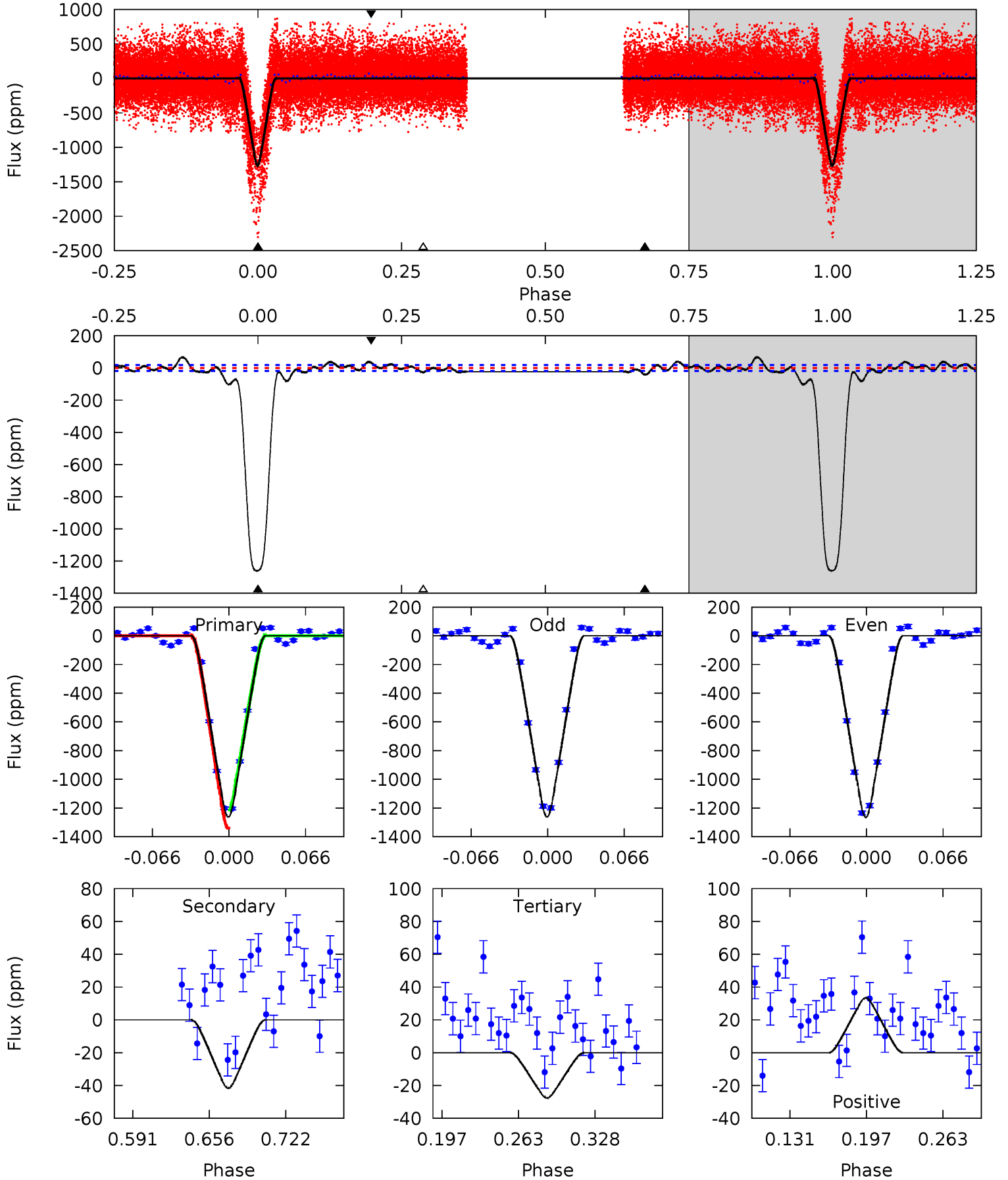
TCE 003233043-02     $P = 0.758930$  Days     $T_0 = 131.919461$  (BKJD)



# DV Model-Shift Uniqueness Test

003233043-02, P = 0.758930 Days, E = 131.161577 Days

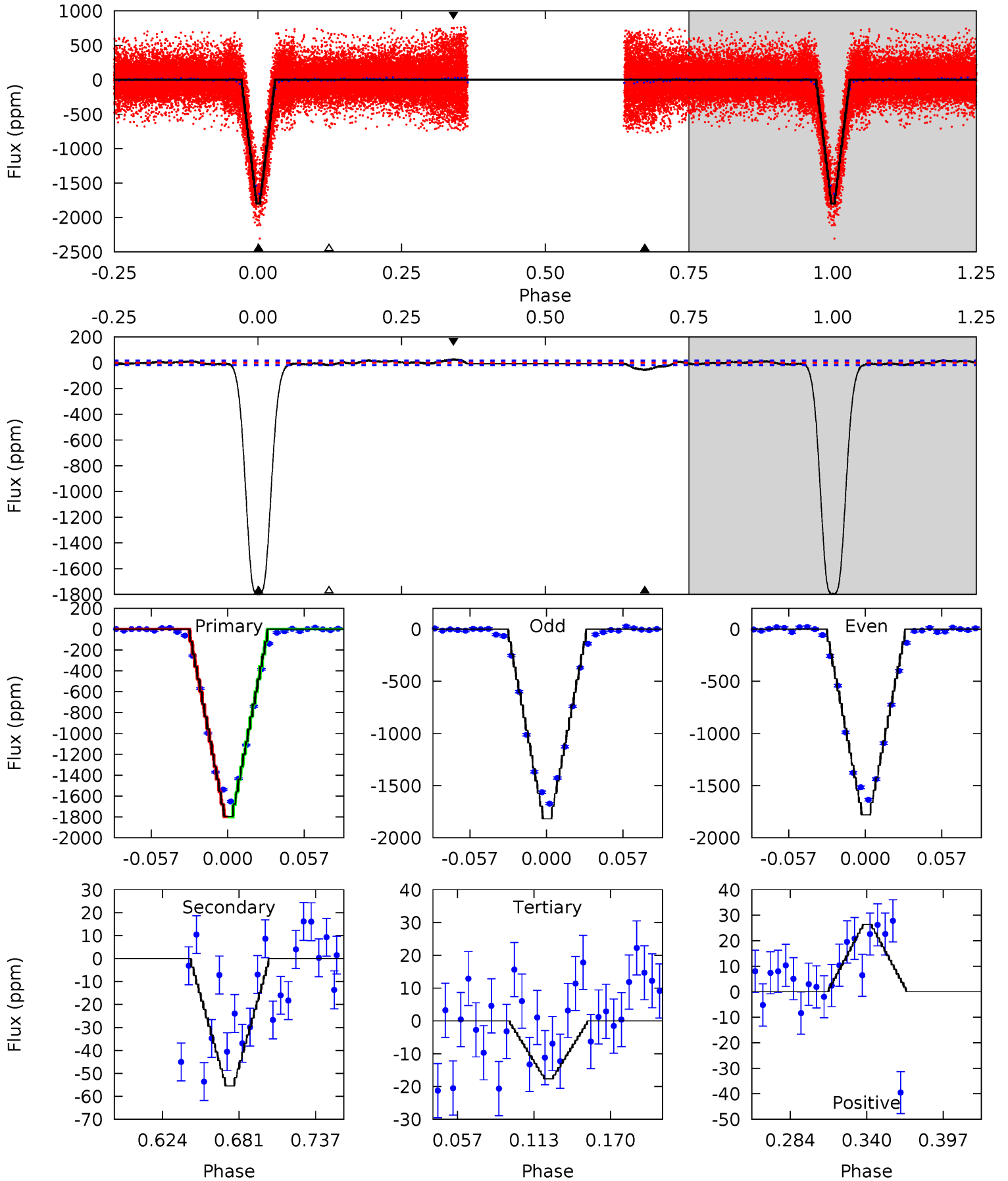
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
322.0	10.6	7.06	8.53	4.65	1.84	4.75	315.0	313.5	3.57	2.11	0.27	0.98	0.05	14.5



# Alt Model-Shift Uniqueness Test

003233043-02, P = 0.758930 Days, E = 131.160531 Days

Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
501.8	15.5	4.93	7.38	4.68	1.91	2.59	496.9	494.5	10.6	8.11	5.39	1.06	0.01	0.39



### Stellar Parameters For KIC 003233043

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$\rho_{\star} (\text{g}\cdot\text{cm}^{-3})$
	$5075^{+136}_{-151}$	$3.892^{+0.707}_{-0.303}$	$-0.060^{+0.300}_{-0.300}$	$1.783^{+1.035}_{-1.139}$	$0.905^{+0.166}_{-0.149}$	$0.225^{+2.558}_{-0.141}$
	+3%/-3%	+18%/-8%	+500%/-500%	+58%/-64%	+18%/-16%	+1137%/-62%
Source	PHO1	KIC0	KIC0	DSEP		

KIC = Kepler Input Catalog; PHO = Photometry; SPE = Spectroscopy; AST = Asteroseismology  
 TRA = Transits; DESP = Dartmouth Models; MULT = Multiple Models

### Secondary Eclipse Parameters for KIC 003233043-02 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{max} (K)$	$T_{obs} (K)$	$A_{obs}$
DV	$-42 \pm 4$	$7.98^{+2.47}_{-2.42}$	$3297^{+475}_{-556}$	$-3070^{+497}_{-346}$	$0.091^{+0.096}_{-0.039}$
Alt.	$-55 \pm 4$	$7.95^{+2.76}_{-2.39}$	$3244^{+513}_{-539}$	$-2973^{+622}_{-407}$	$0.122^{+0.122}_{-0.055}$

$T_{max}$  = Theoretical Maximum Planetary Temperature  
 $T_{obs}$  = Observed Planetary Temperature (Assuming  $A=0.3$ )  
 $A_{obs}$  = Observed Albedo (Assuming  $T=0$ )

If a secondary eclipse is present, the system is likely an EB if  $T_{obs} \gg T_{max}$  AND  $A_{obs} \gg 1.0$

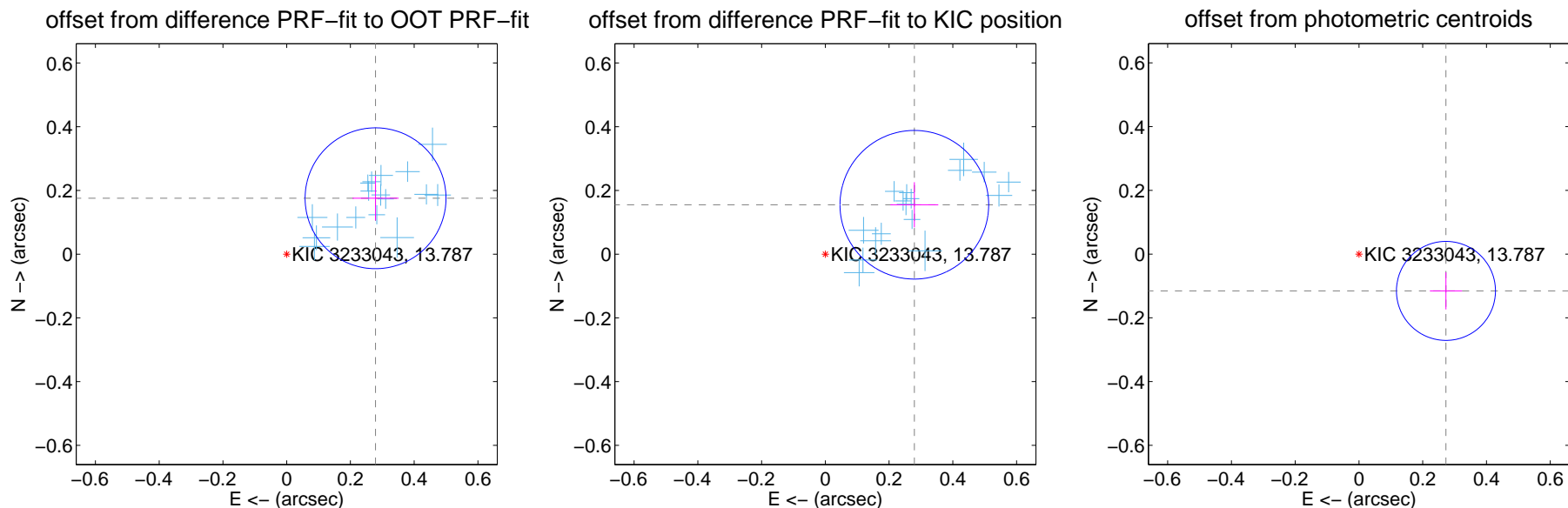
## DV Centroid Data

Supplemental centroid analysis for 003233043-02. Kepler magnitude: 13.79. Transit SNR 121.01

There are 17 quarters with good PRF difference image offsets

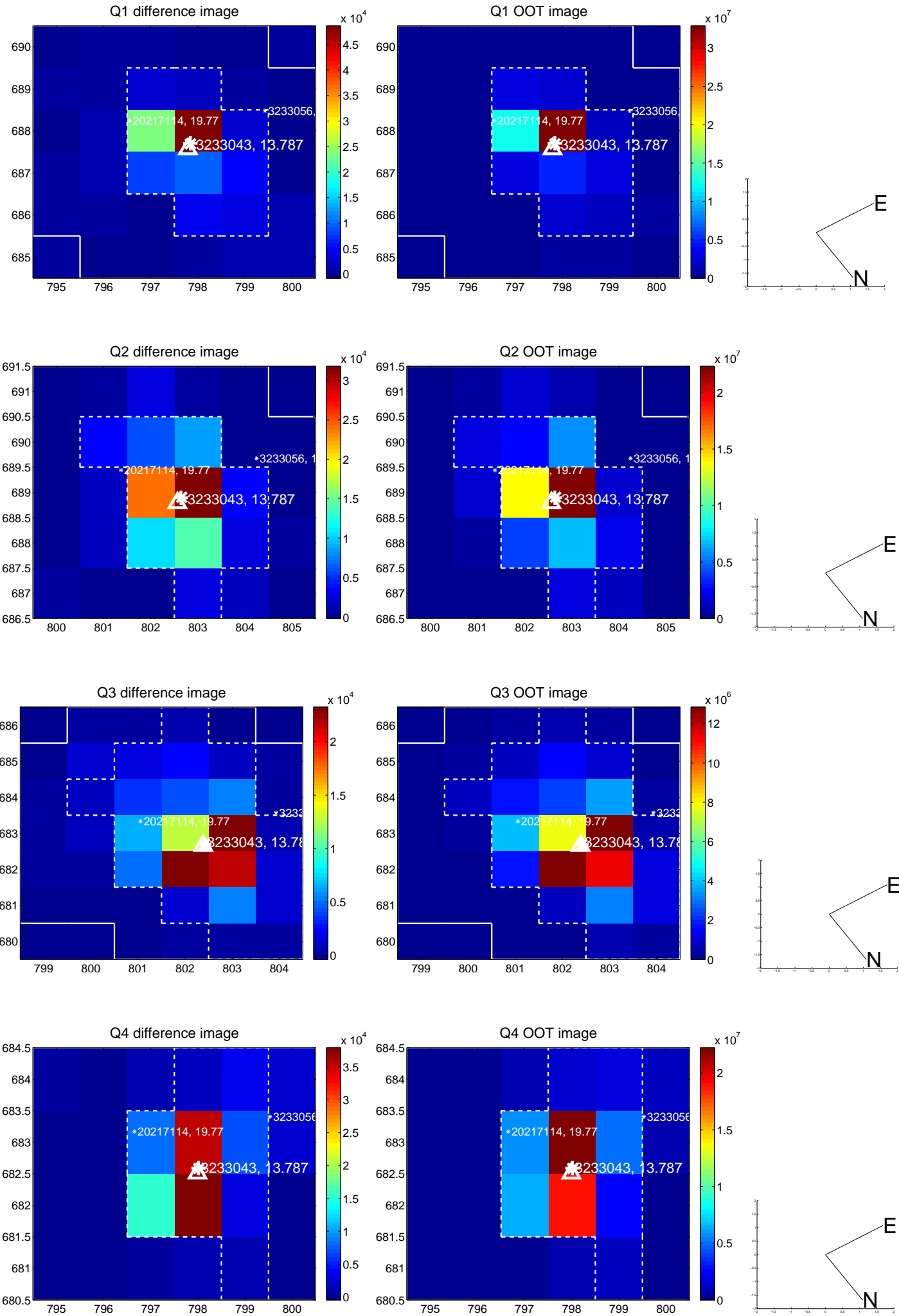
The direct PRF centroid is offset from the target star catalog position by about 0.05 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$0.329 \pm 0.074$	4.47	$-0.279 \pm 0.072$	$0.175 \pm 0.070$
PRF-fit source offset from KIC position	$0.319 \pm 0.078$	4.11	$-0.279 \pm 0.075$	$0.155 \pm 0.071$
photometric centroid source offset	$0.30 \pm 0.05$	5.72	$-0.27 \pm 0.05$	$-0.12 \pm 0.06$



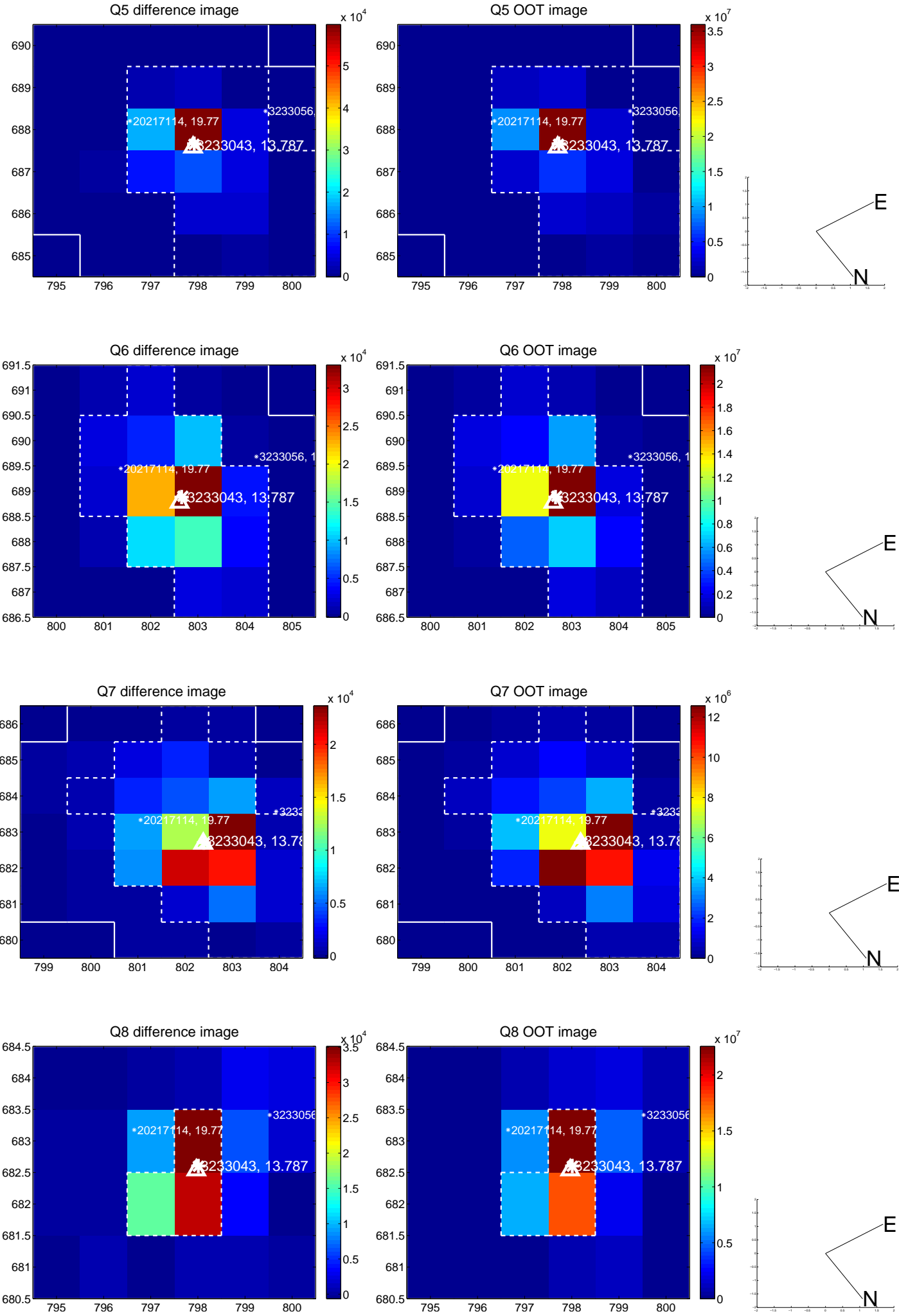
Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses:** good quarterly centroid offsets; **Vermillion crosses:** bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: three- $\sigma$ . Red \*: target star. Blue \*: Other stars. Text next to a star gives its KIC ID and kepmag. KIC IDs > 15,000,000 are from the UKIRT catalog.

white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.

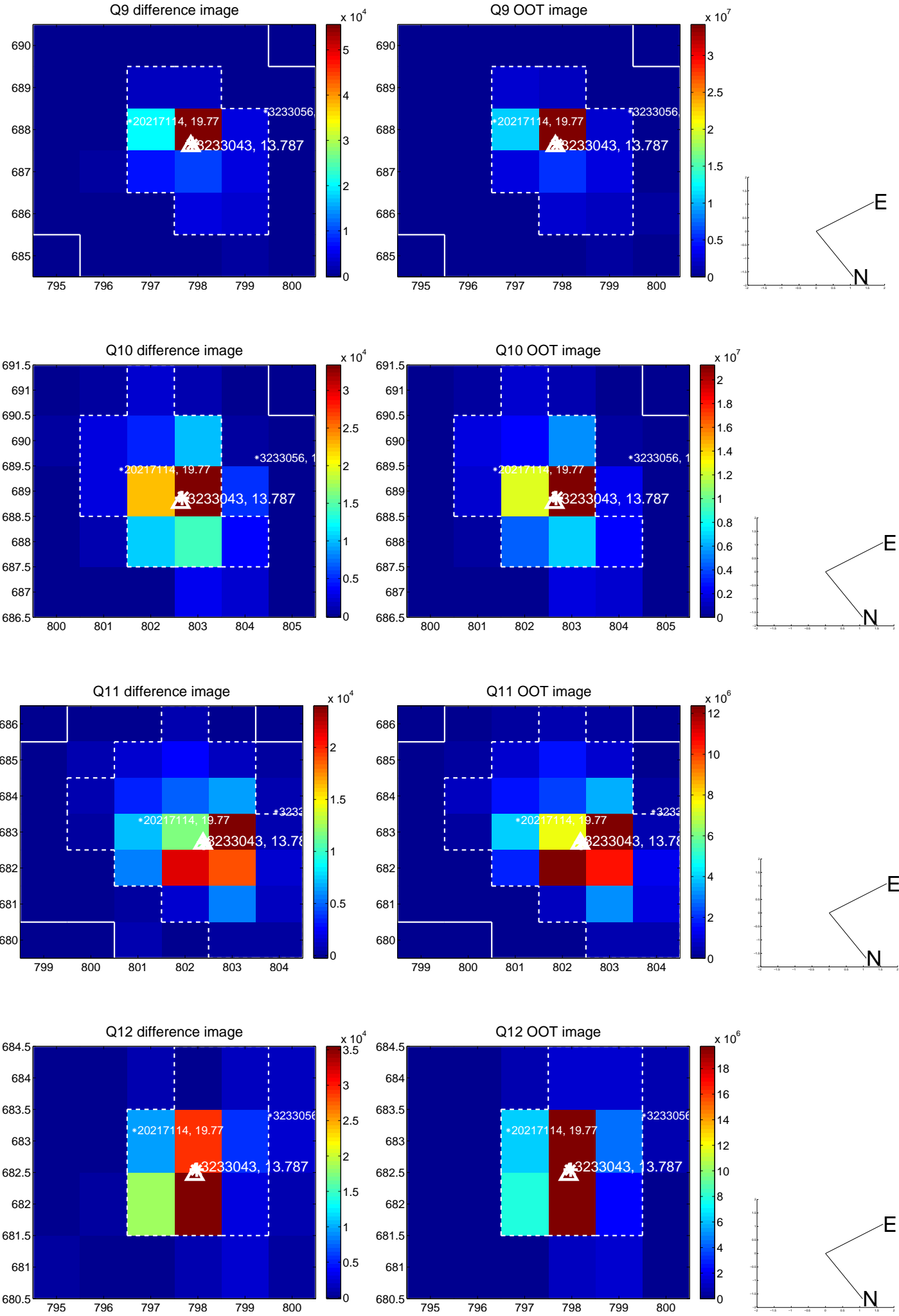




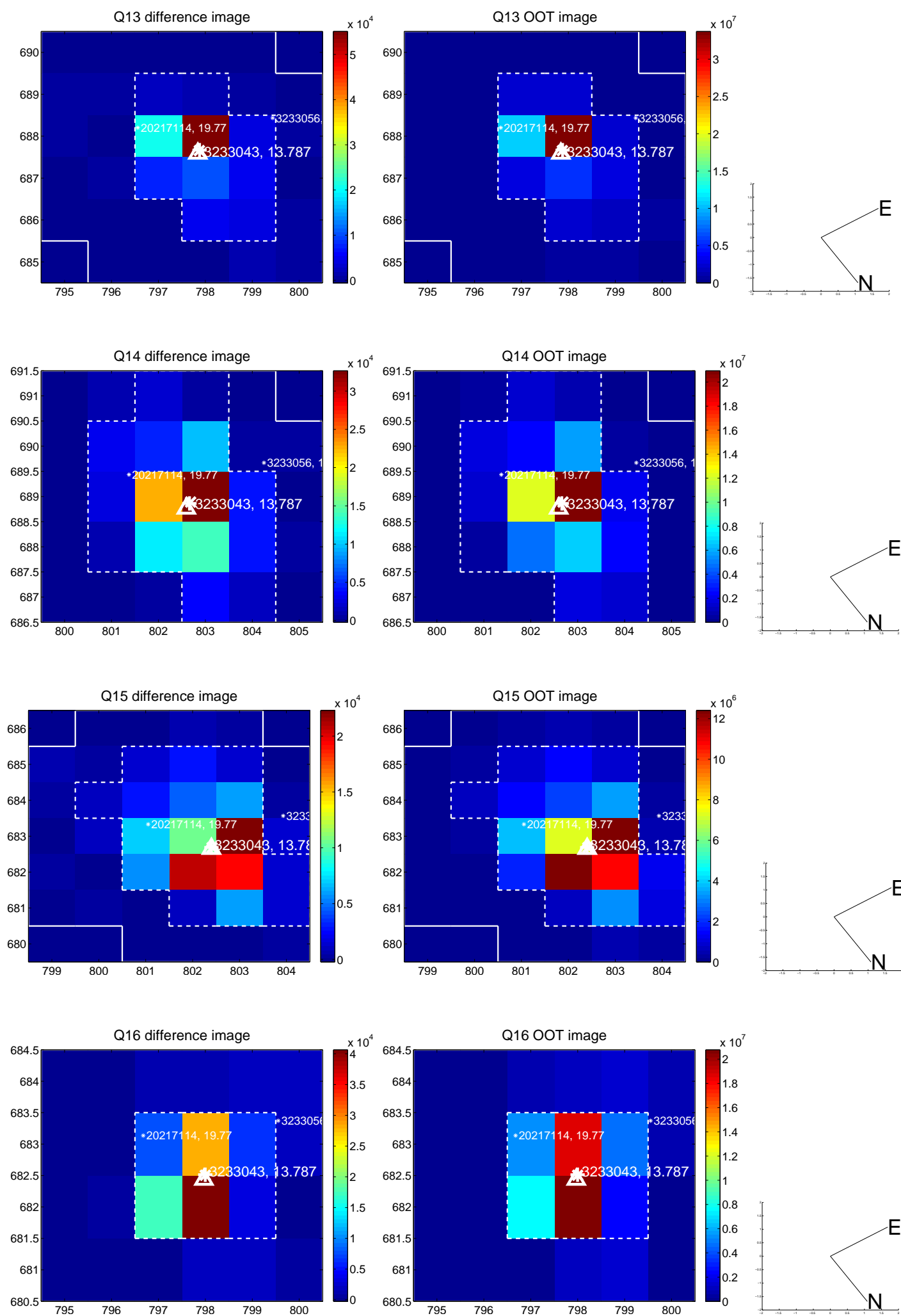
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



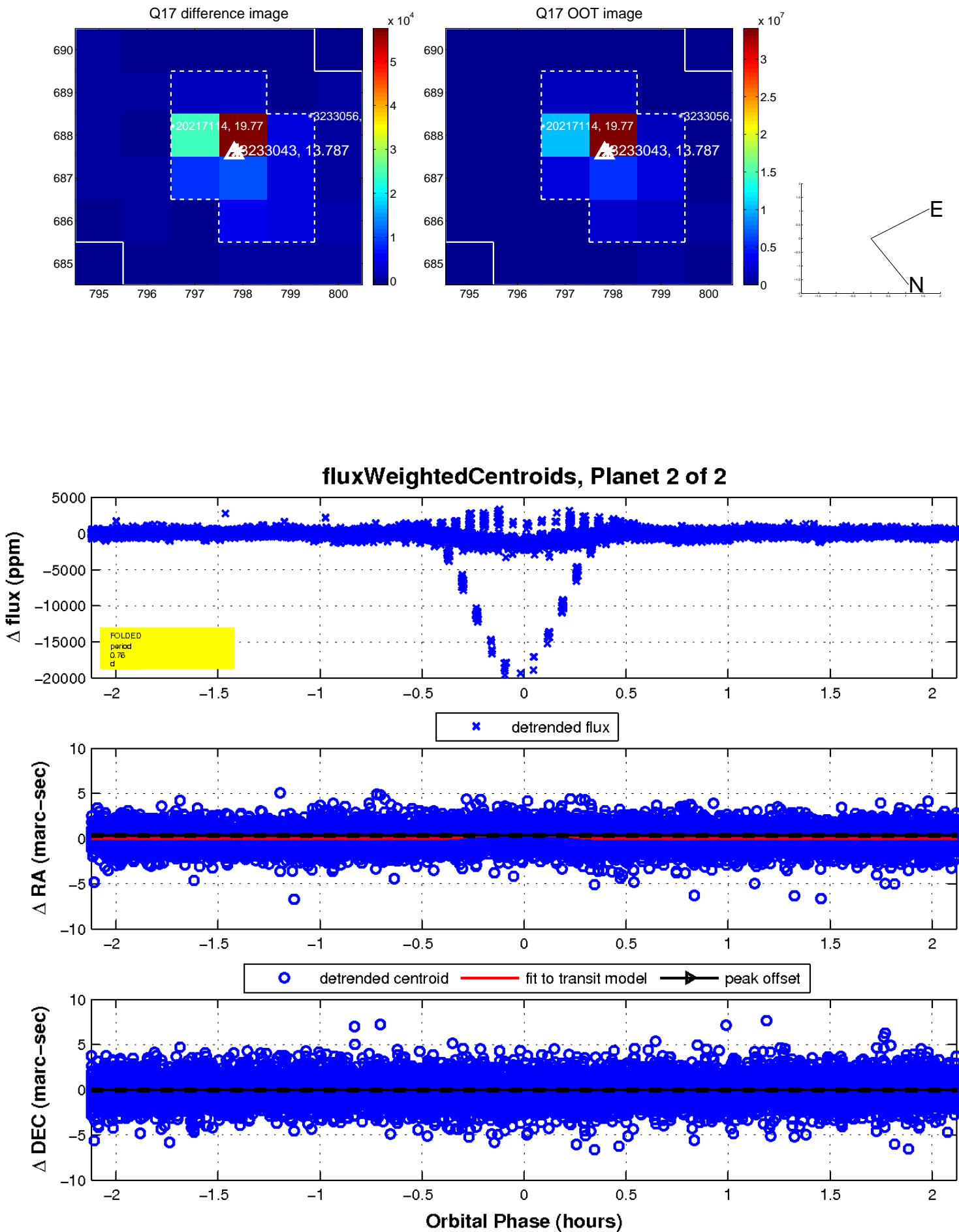
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



# UKIRT Image

Declination

